

# KIC 009818269

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009818269-01	OBS	No	0.660190	131.723037	37.5	2.599	12.9	15.1	1.84	7479	1.30	30627.80
009818269-02	OBS	No	0.660192	131.941646	31.6	2.302	9.2	12.3	1.84	7479	1.20	30627.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009818269-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED
009818269-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

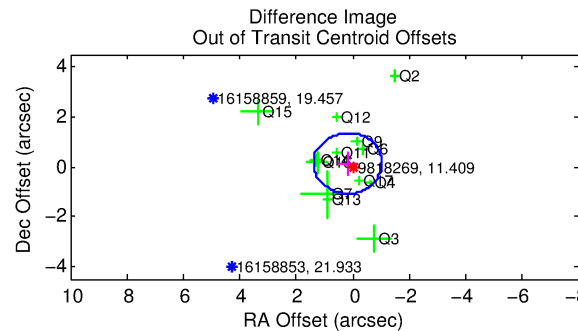
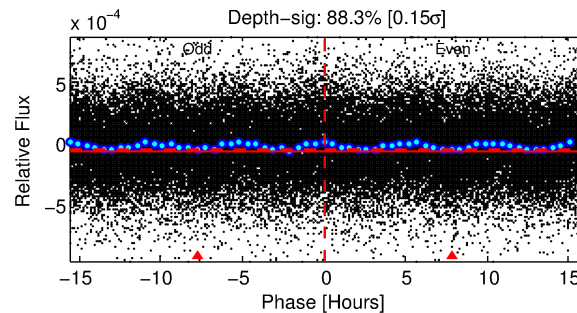
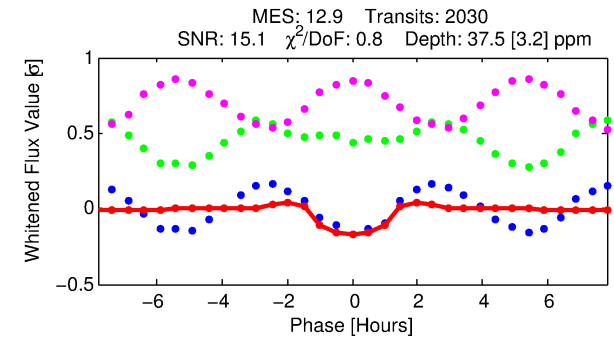
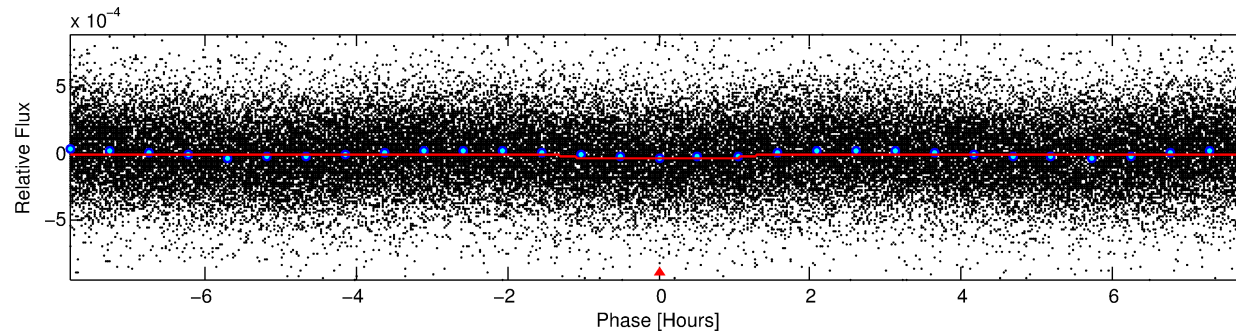
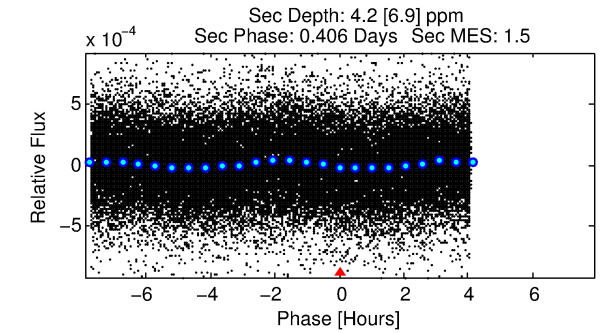
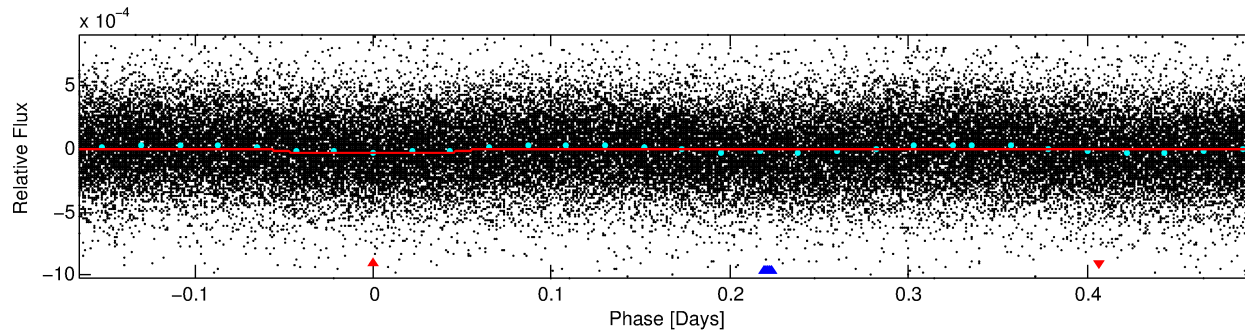
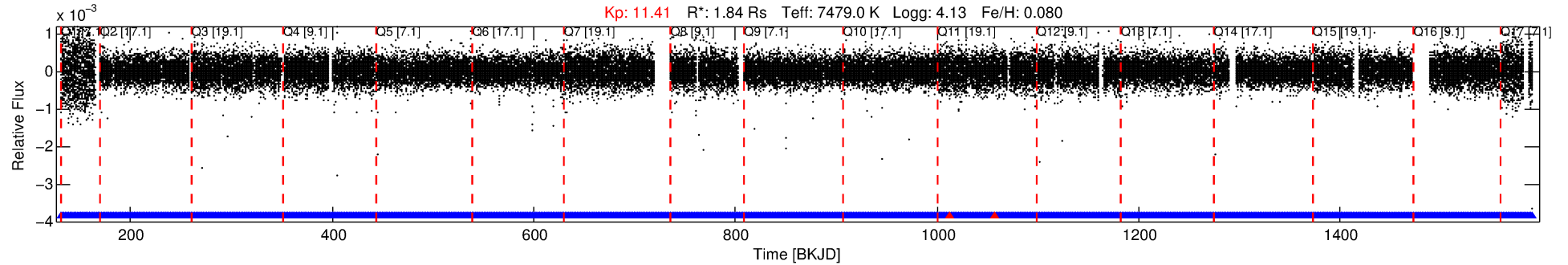
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009818269-01

No Significant Match Found

# DV One-Page Summary

KIC: 9818269 Candidate: 1 of 2 Period: 0.660 d



## DV Fit Results:

Period = 0.66019 [0.00001] d  
Epoch = 131.7230 [0.0019] BKJD  
Rp/R\* = 0.0065 [0.0019]  
a/R\* = 1.28 [0.98]  
b = 0.90 [0.41]  
Seff = 30627.80 [11998.01]  
Teq = 3373 [330] K  
Rp = 1.30 [0.56] Re  
a = 0.0176 [0.0044] AU  
Ag = 0.43 [0.75] [-0.77σ]  
Teffp = 4213 [1827] K [0.45σ]

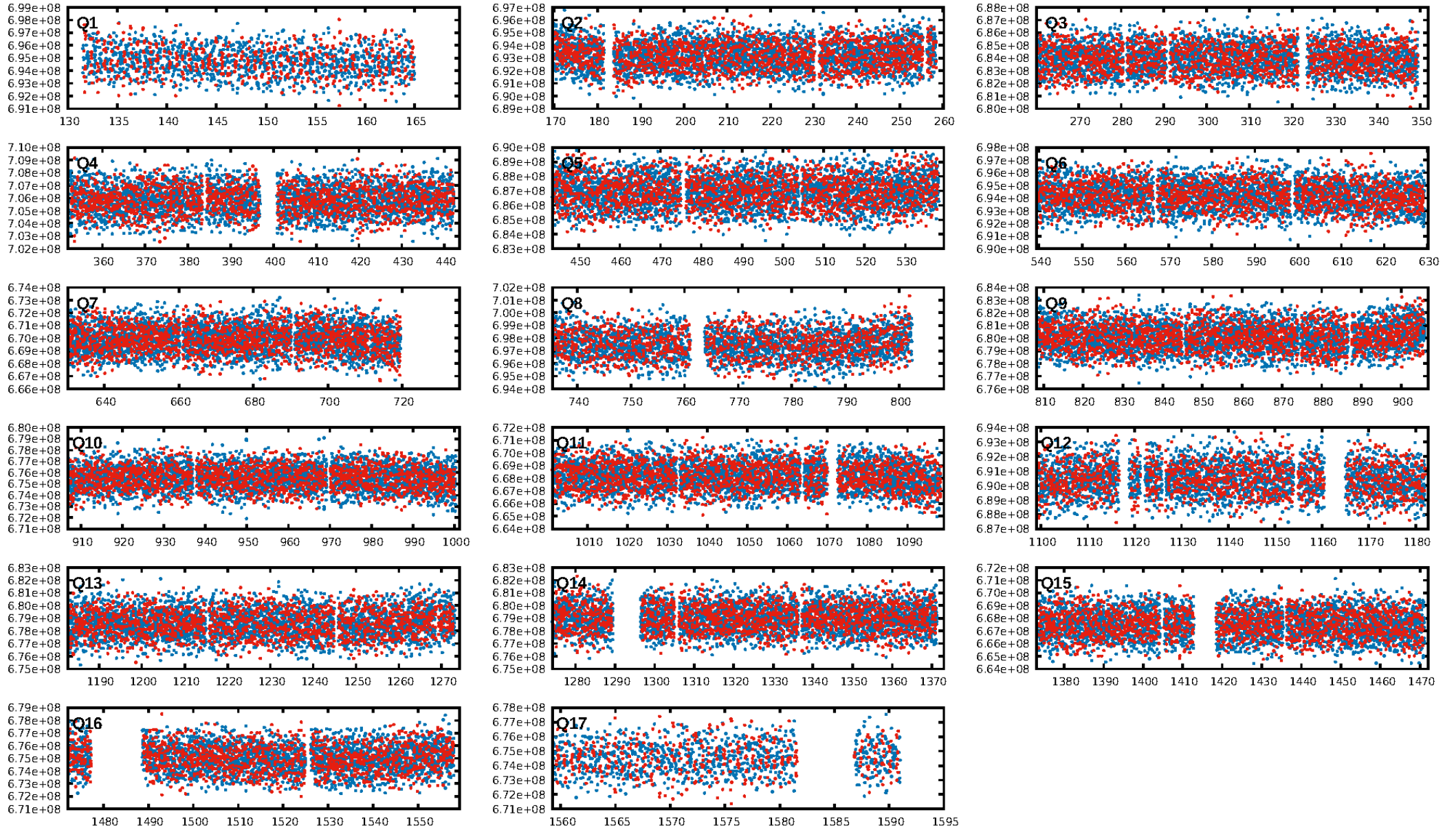
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.85e-17  
RollingBand-fgt: 1.00 [1936/1938]  
GhostDiagnostic-chr: 3.475  
Centroid-sig: 58.7%  
Centroid-so: 0.112 arcsec [0.72σ]  
OotOffset-rm: 0.230 arcsec [0.57σ]  
OotOffset-st: 3/4/3/3 [13]  
KicOffset-rm: 0.281 arcsec [0.85σ]  
KicOffset-st: 3/4/3/3 [13]  
DiffImageQuality-fgm: 0.54 [7/13]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:30:17 Z

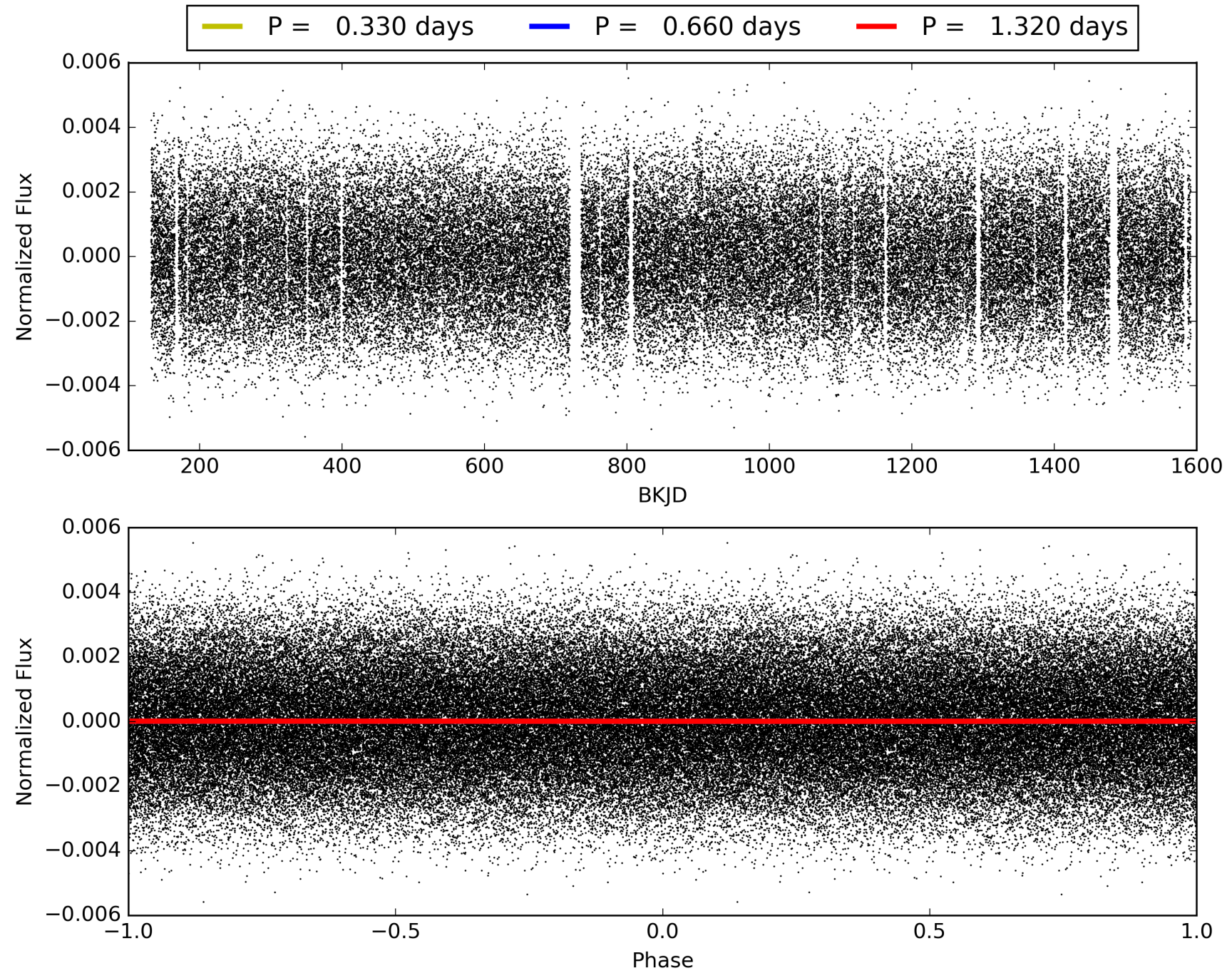
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009818269-01, PDC Light Curves



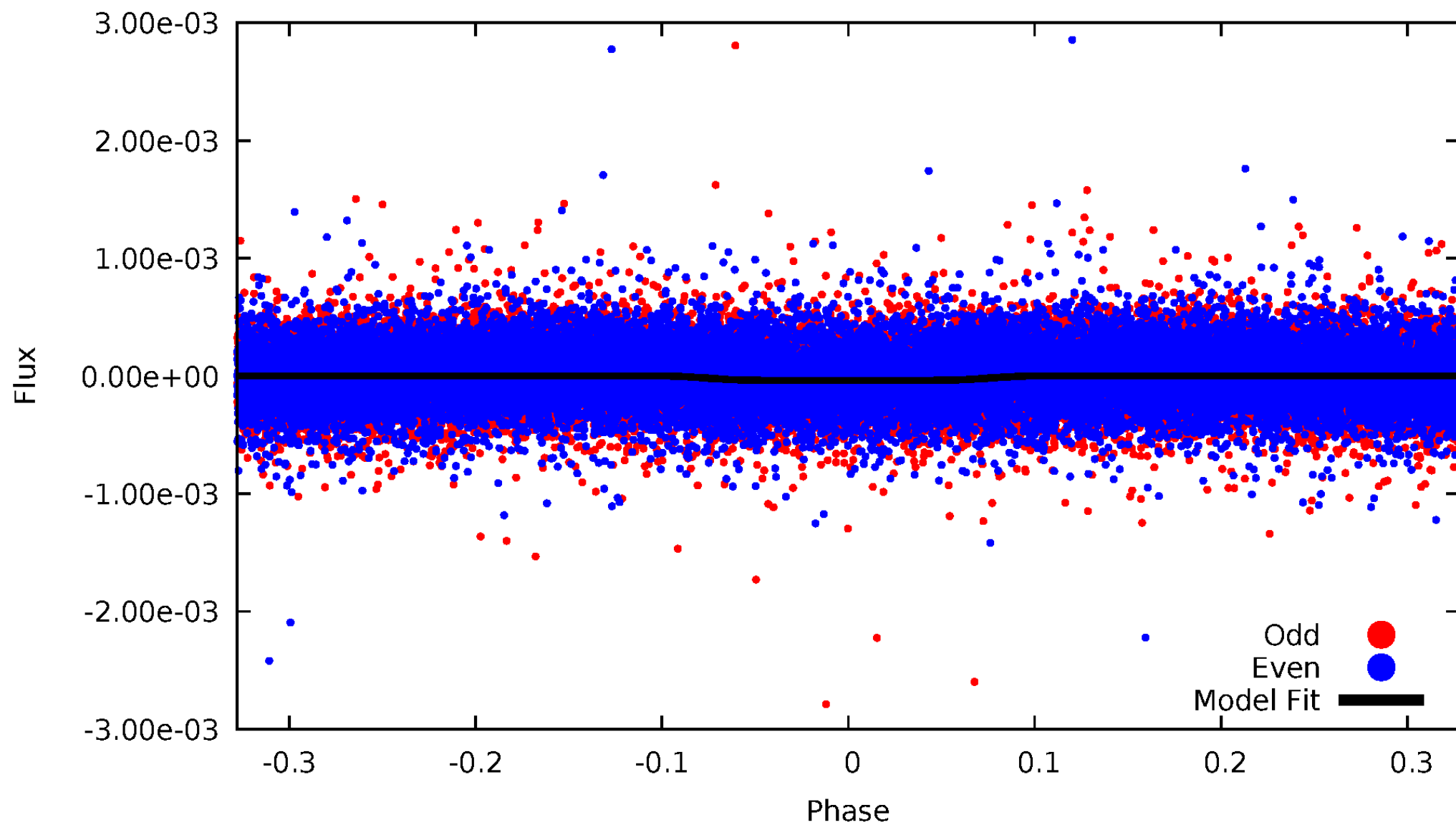


TCE 009818269-01



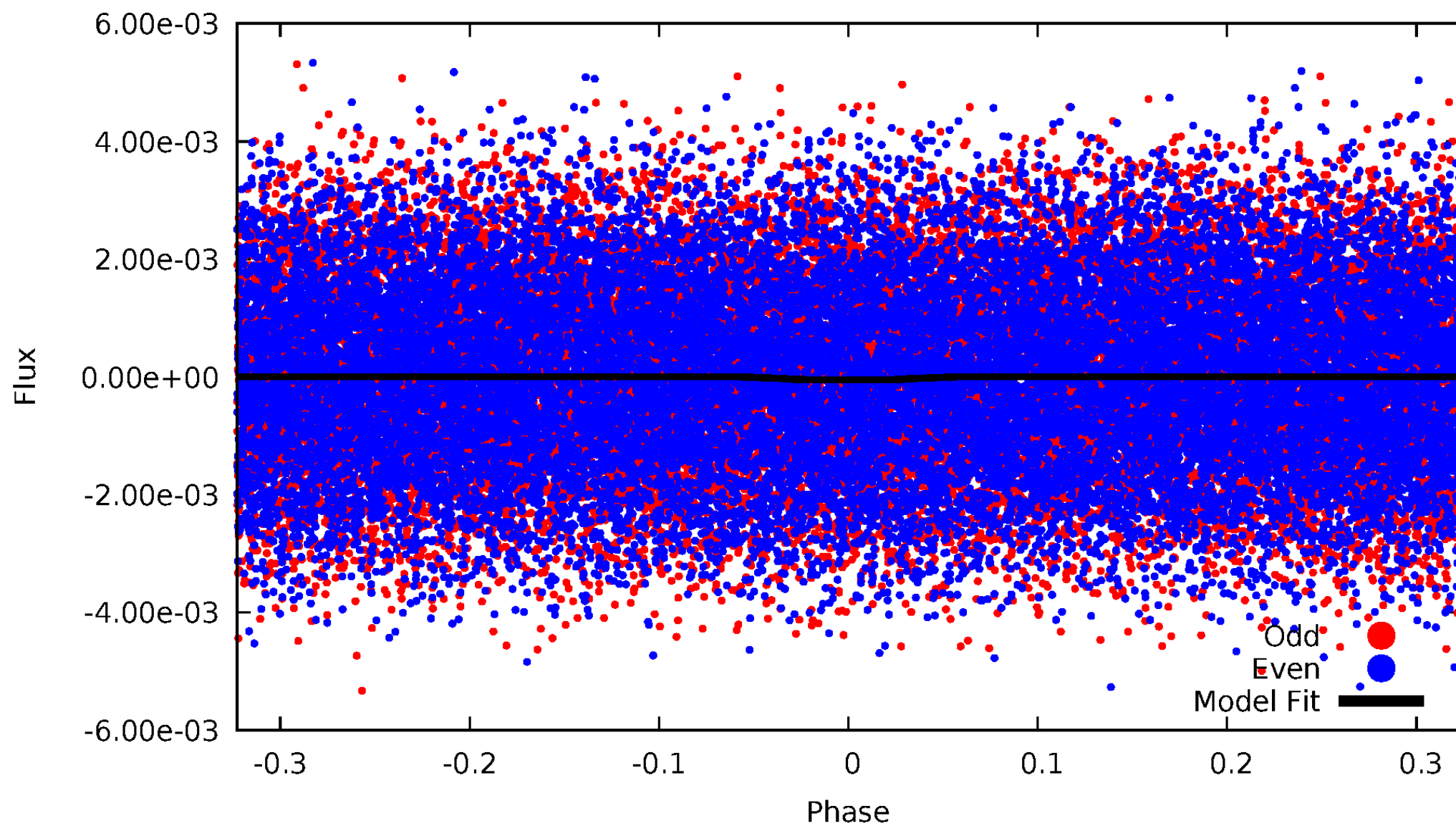
# DV Odd/Even

TCE 009818269-01

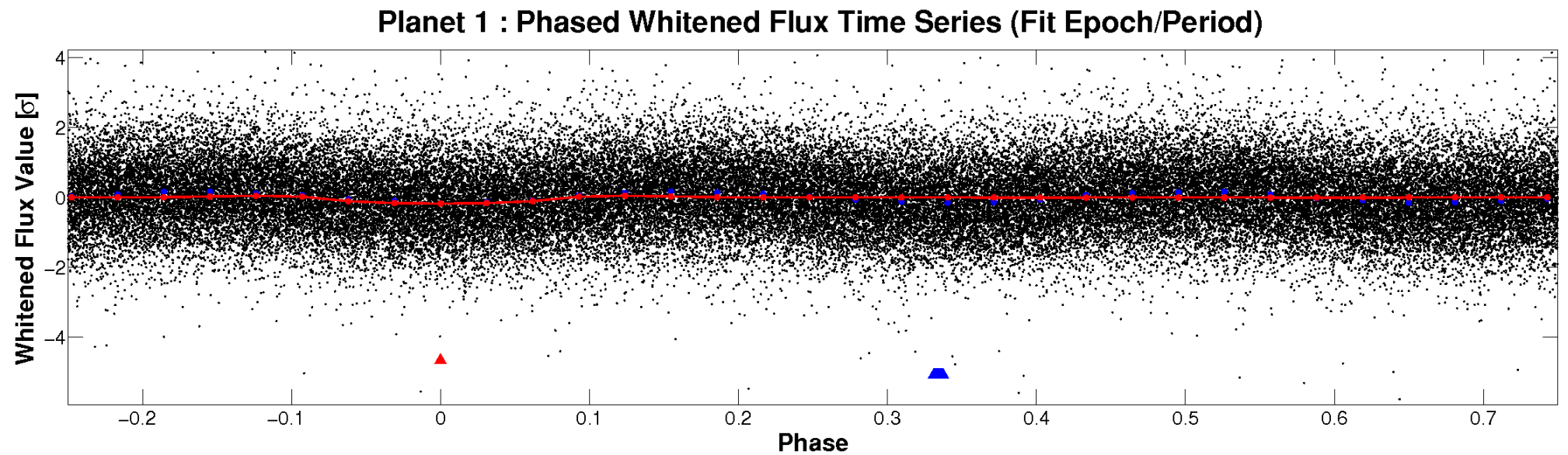
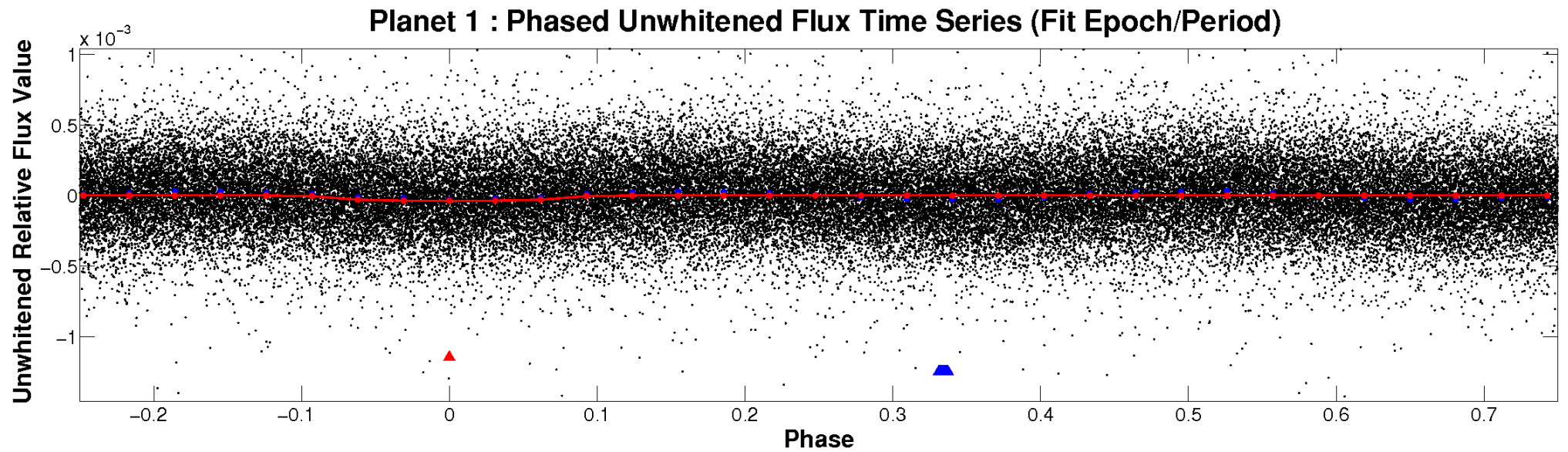


# ALT Odd/Even

TCE 009818269-01



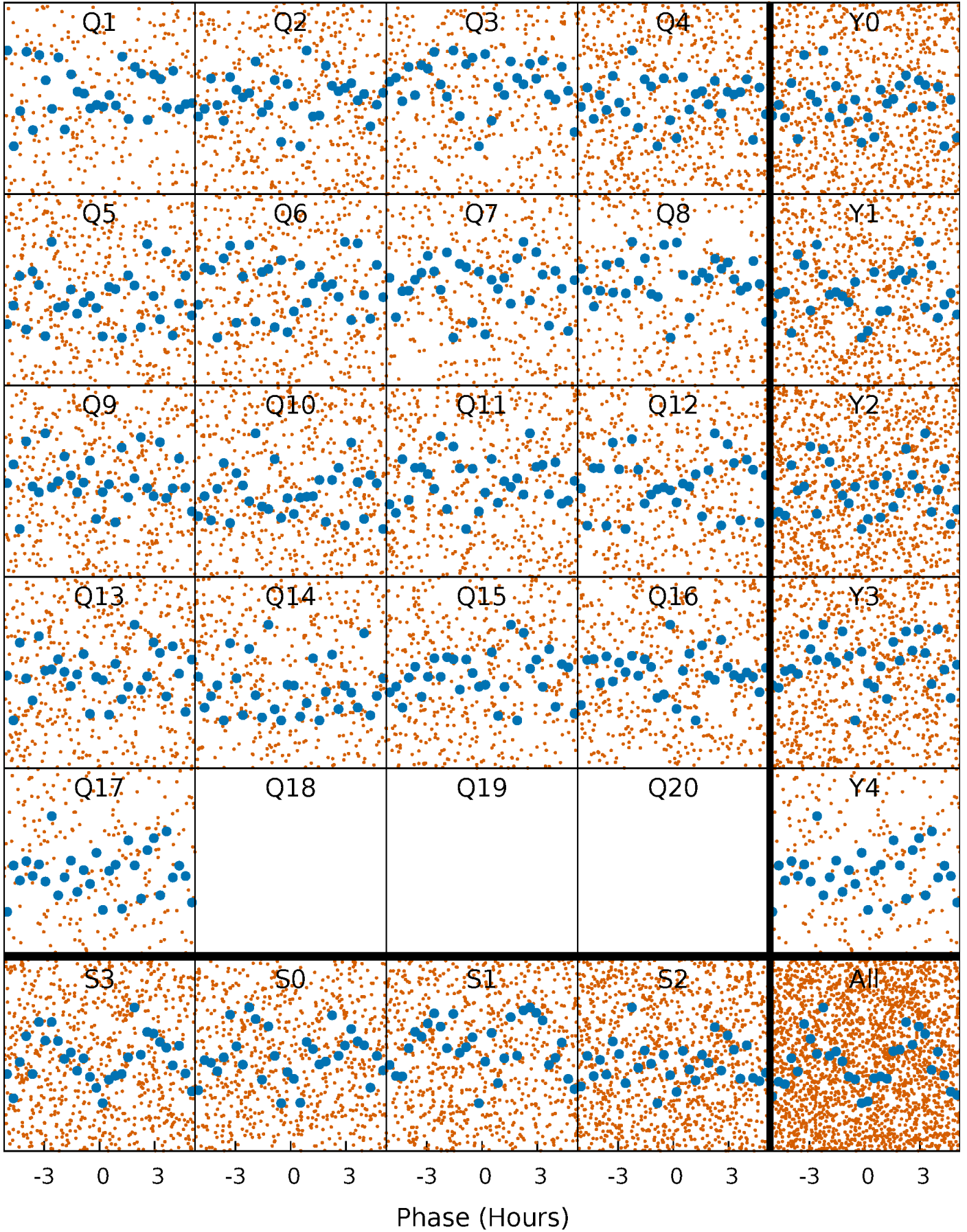
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

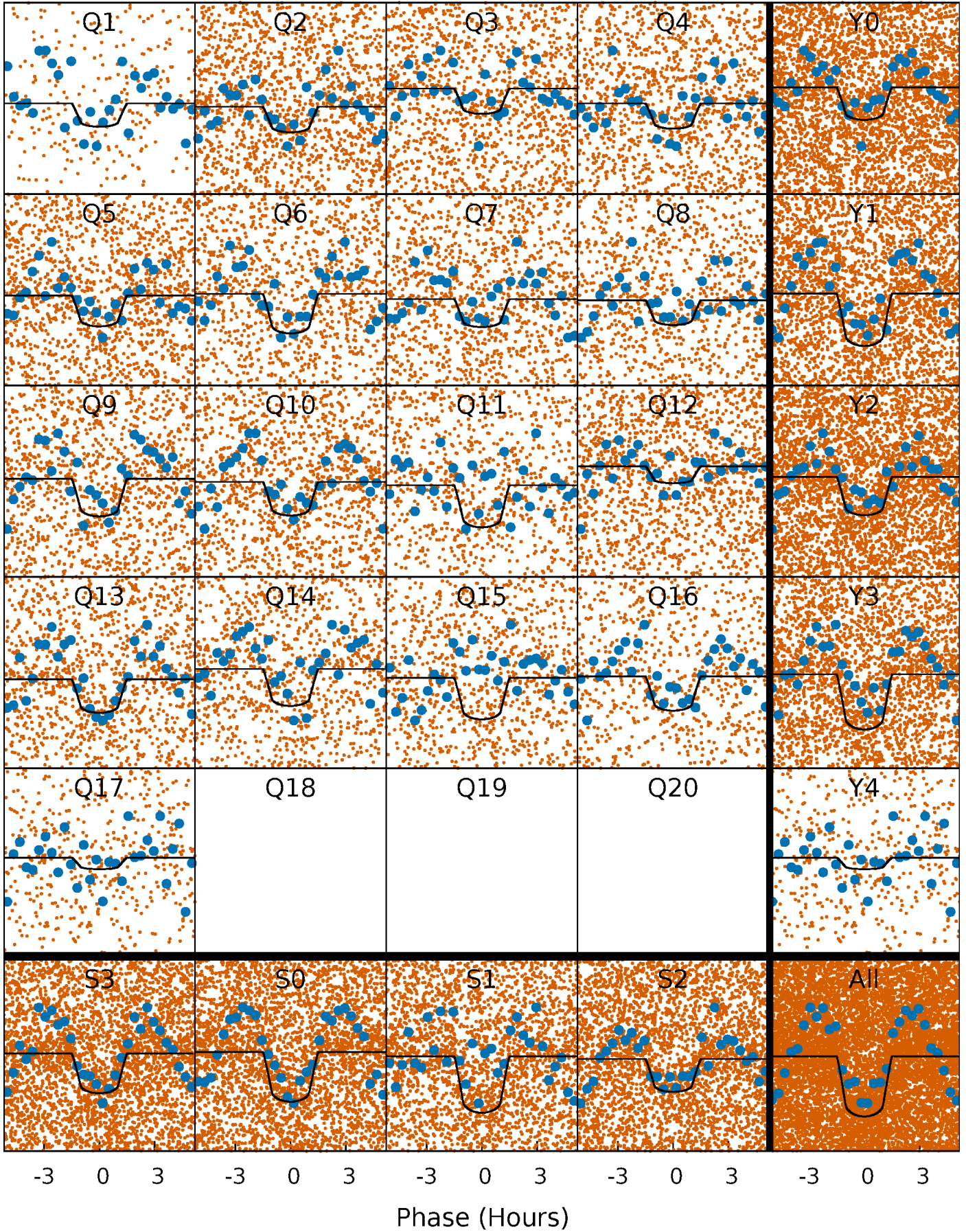
TCE 009818269-01 P= 0.660190 Days  $T_0=131.723037$  (BKJD)





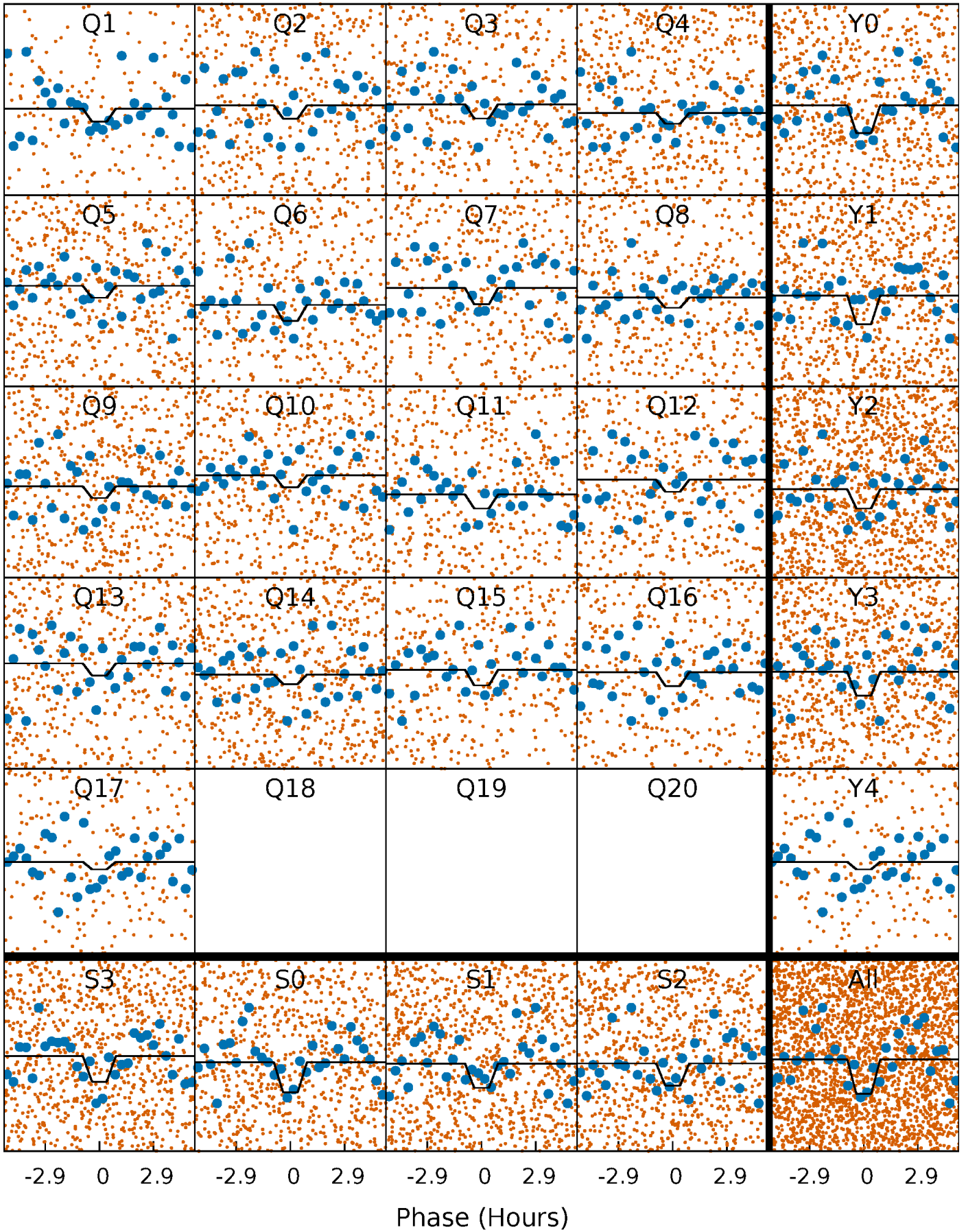
# DV Quarter-Phased Transit Curves

TCE 009818269-01 P= 0.660190 Days  $T_0=131.723037$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

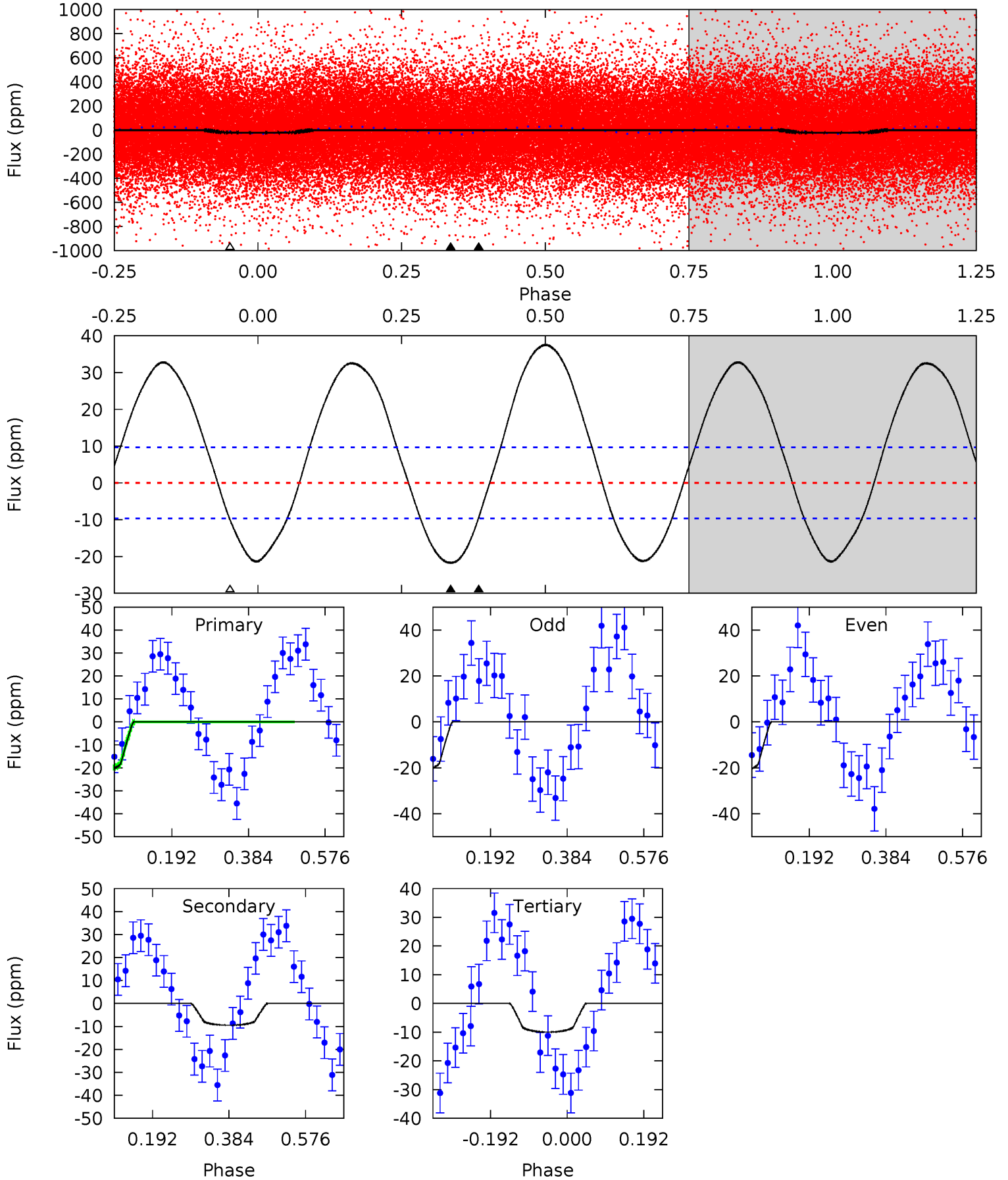
TCE 009818269-01 P= 0.660192 Days  $T_0=131.723263$  (BKJD)



# DV Model-Shift Uniqueness Test

009818269-01, P = 0.660190 Days, E = 131.062847 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.94	4.34	4.56	0	4.43	1.30	8.26	5.38	9.94	-0.23	4.34	0.10	0.89	0.63	0.14

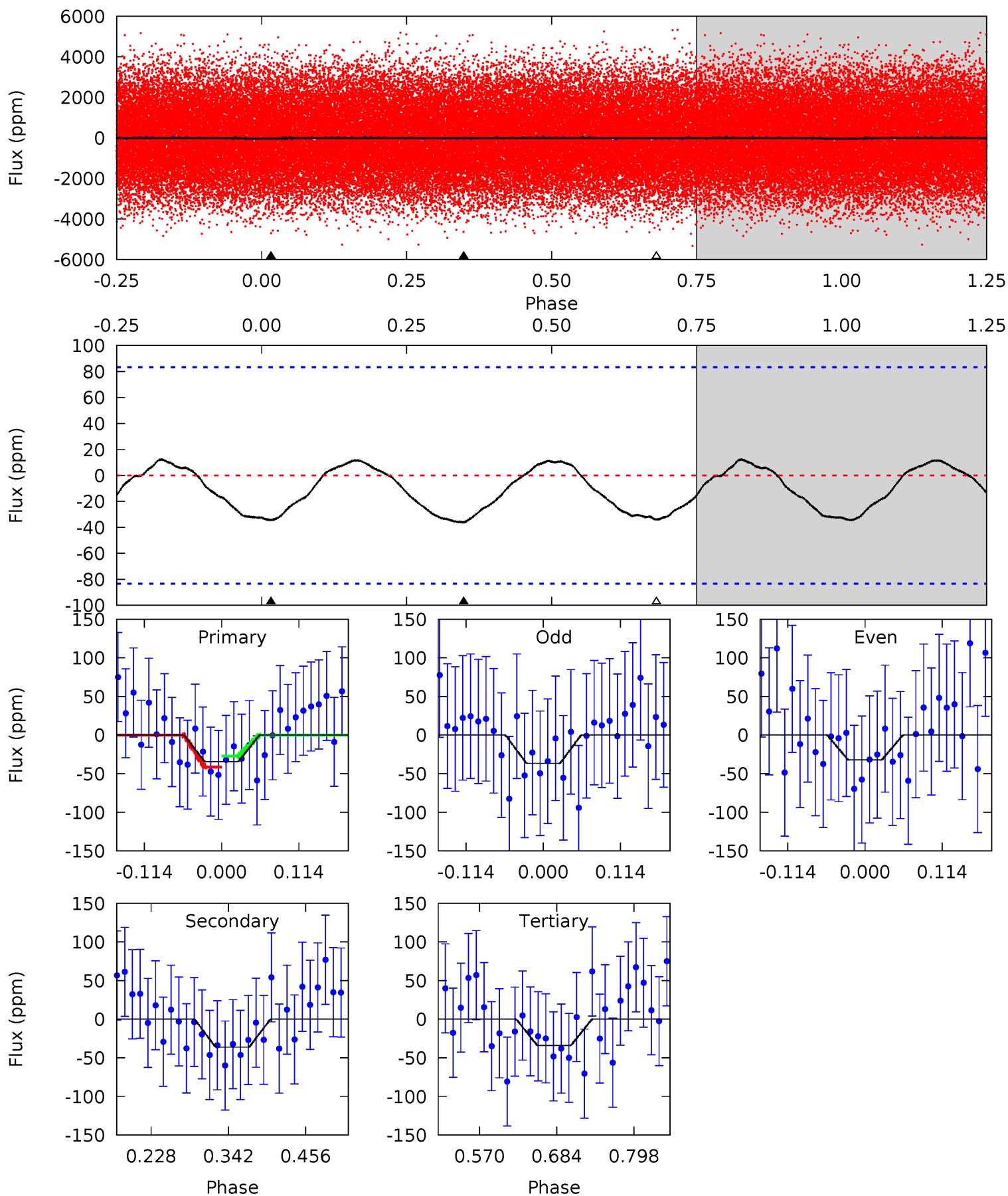




# Alt Model-Shift Uniqueness Test

009818269-01, P = 0.660192 Days, E = 131.063071 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.87	1.97	1.85	0	4.54	1.58	0.84	0.02	1.87	0.12	1.97	0.12	0.73	0.25	0.39





### Stellar Parameters For KIC 009818269

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7479^{+210}_{-341}$	$4.130^{+0.105}_{-0.180}$	$0.080^{+0.200}_{-0.350}$	$1.837^{+0.577}_{-0.311}$	$1.658^{+0.205}_{-0.251}$	$0.377^{+0.216}_{-0.184}$
	+3%/-5%	+3%/-4%	+250%/-438%	+31%/-17%	+12%/-15%	+57%/-49%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 009818269-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-9 \pm 2$	$1.34^{+0.45}_{-0.42}$	$4733^{+356}_{-258}$	$4625^{+1107}_{-803}$	$0.852^{+0.960}_{-0.370}$
Alt.	$-36 \pm 18$	$1.37^{+0.46}_{-0.39}$	$4727^{+361}_{-280}$	$6609^{+1792}_{-1446}$	$2.968^{+3.495}_{-1.757}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

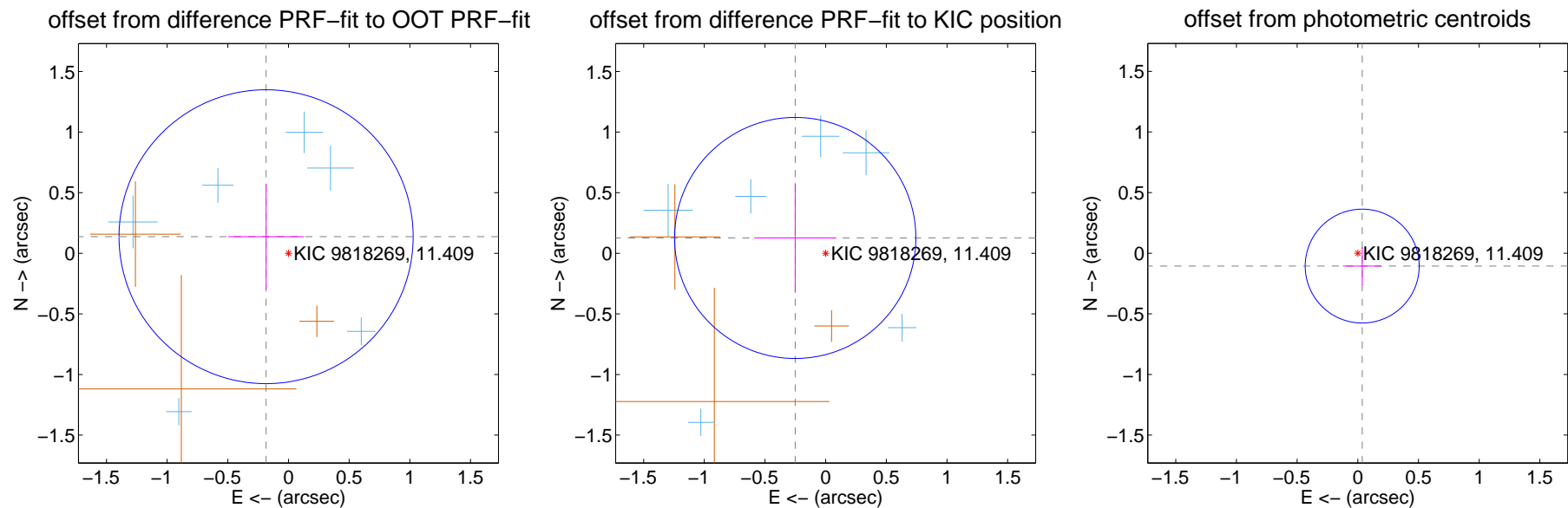
## DV Centroid Data

Supplemental centroid analysis for 009818269-01. **Kepler magnitude: 11.41.** Transit SNR 15.07

There are 7 quarters with good PRF difference image offsets

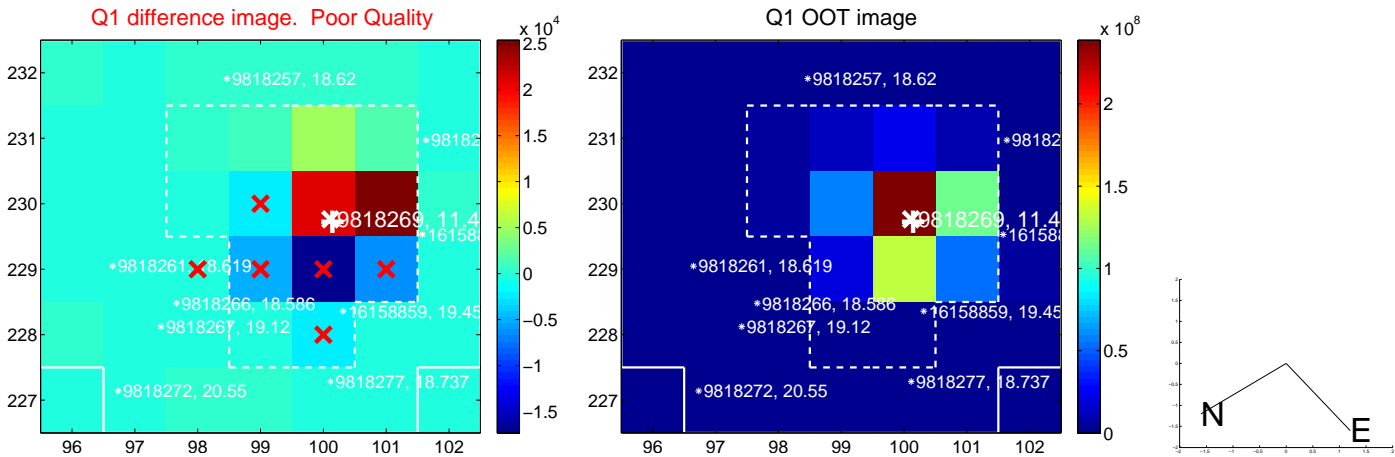
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.230 \pm 0.404$	0.57	$0.185 \pm 0.313$	$0.137 \pm 0.437$
PRF-fit source offset from KIC position	$0.281 \pm 0.331$	0.85	$0.251 \pm 0.338$	$0.127 \pm 0.452$
photometric centroid source offset	$0.11 \pm 0.16$	0.72	$-0.04 \pm 0.16$	$-0.11 \pm 0.16$

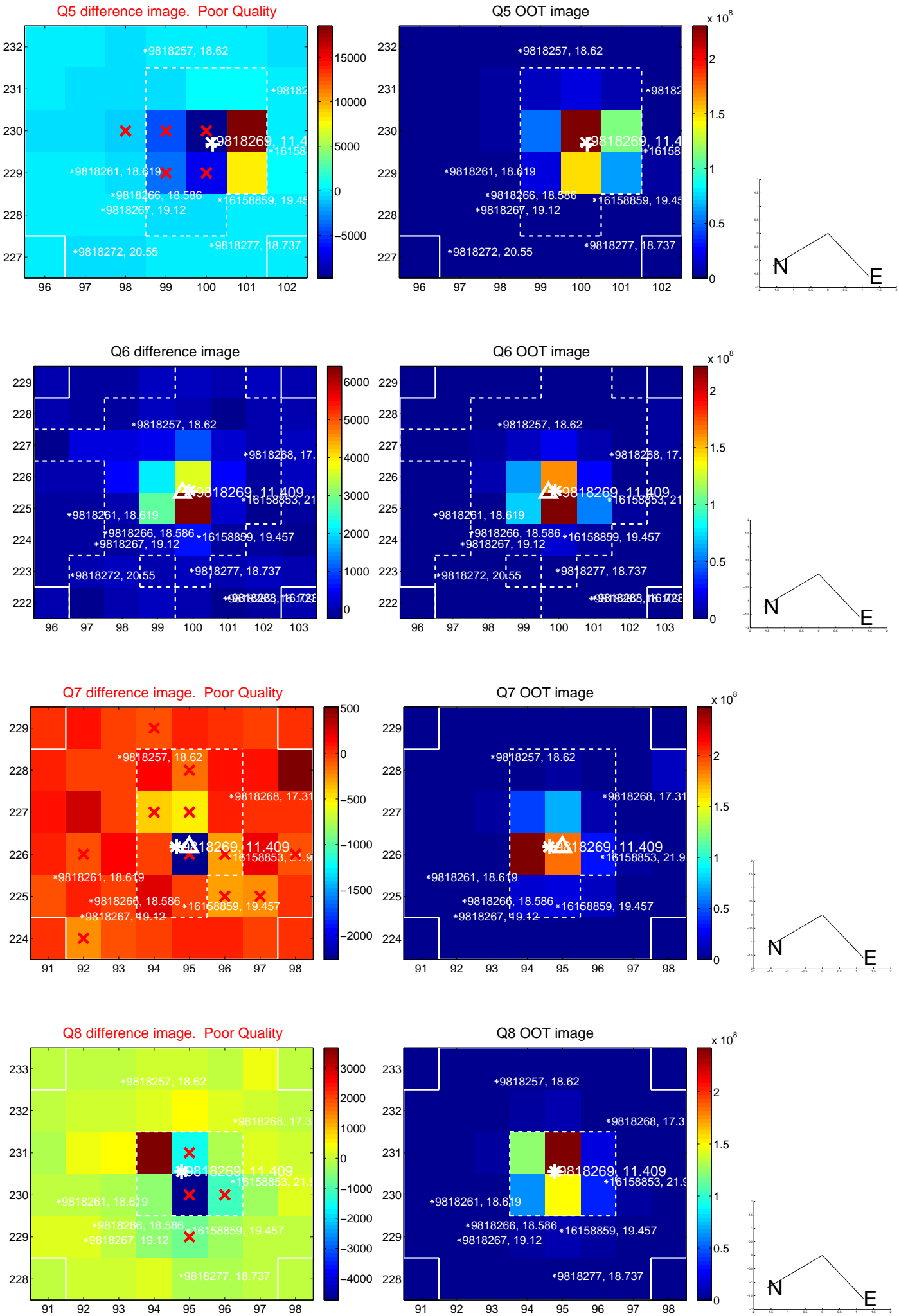


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

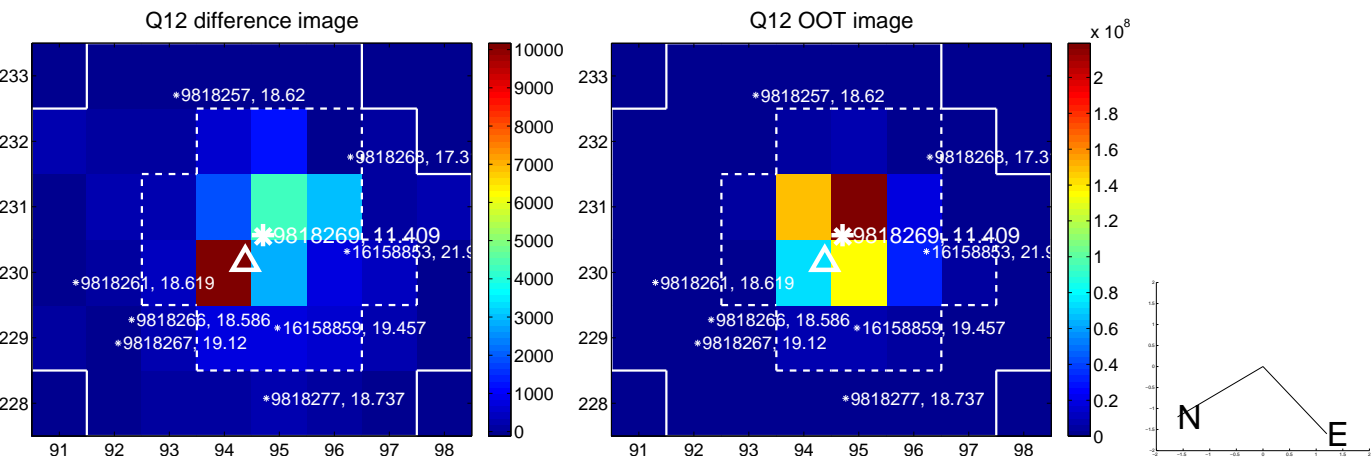
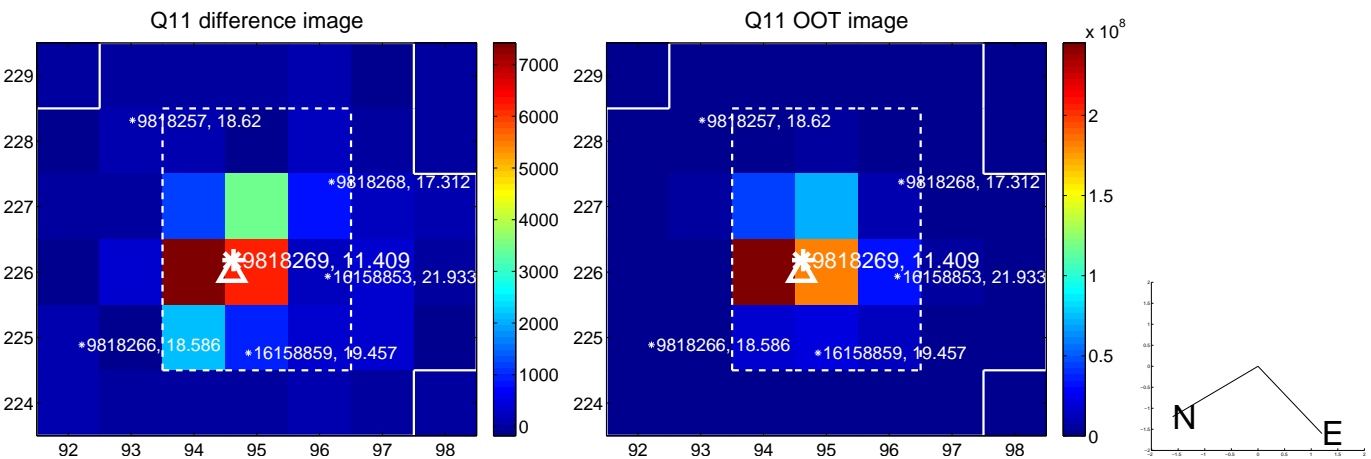
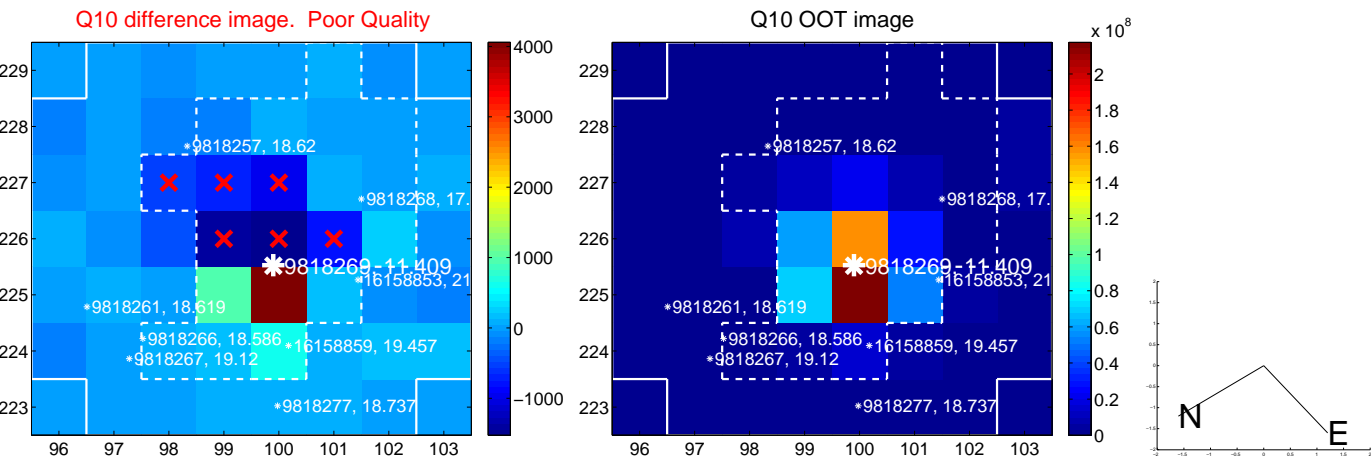
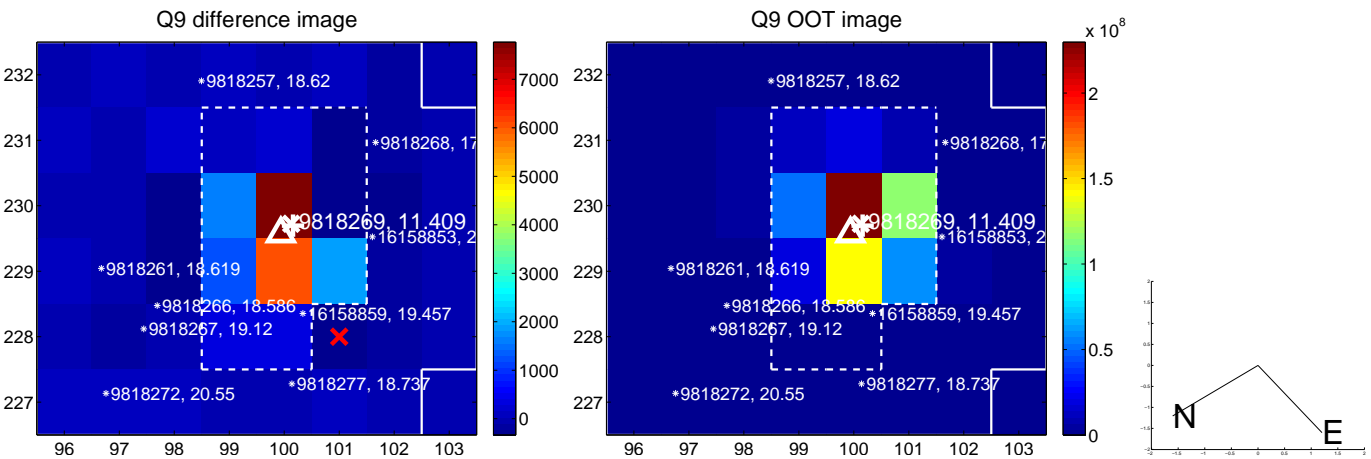


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

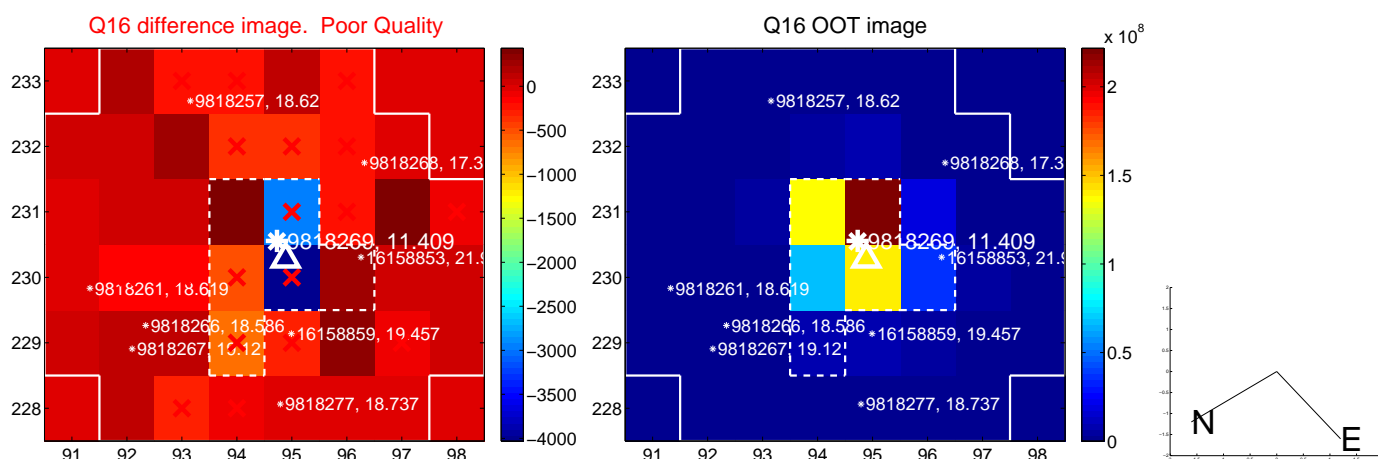
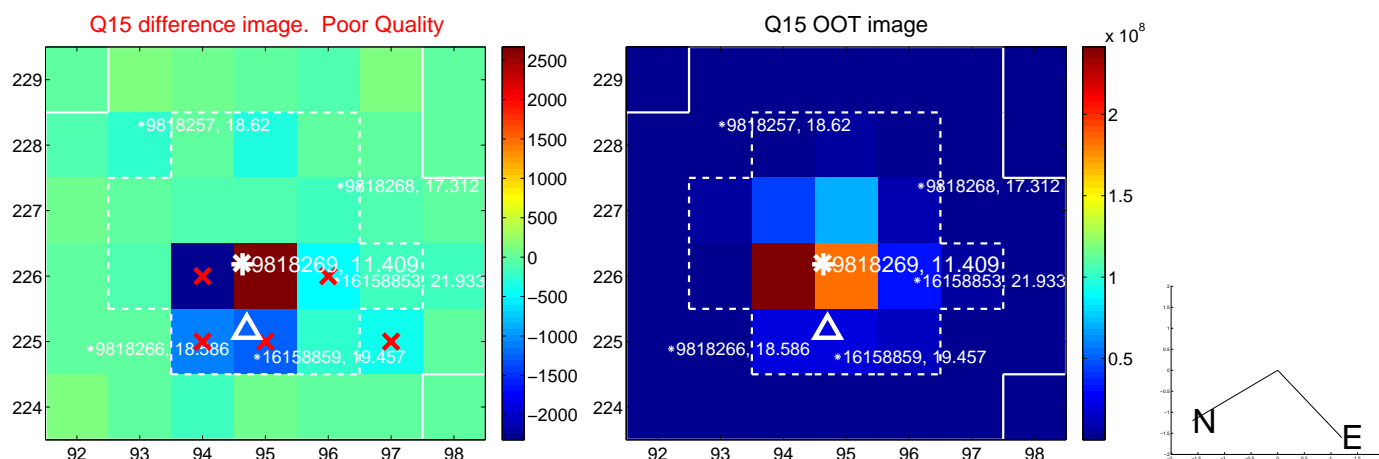
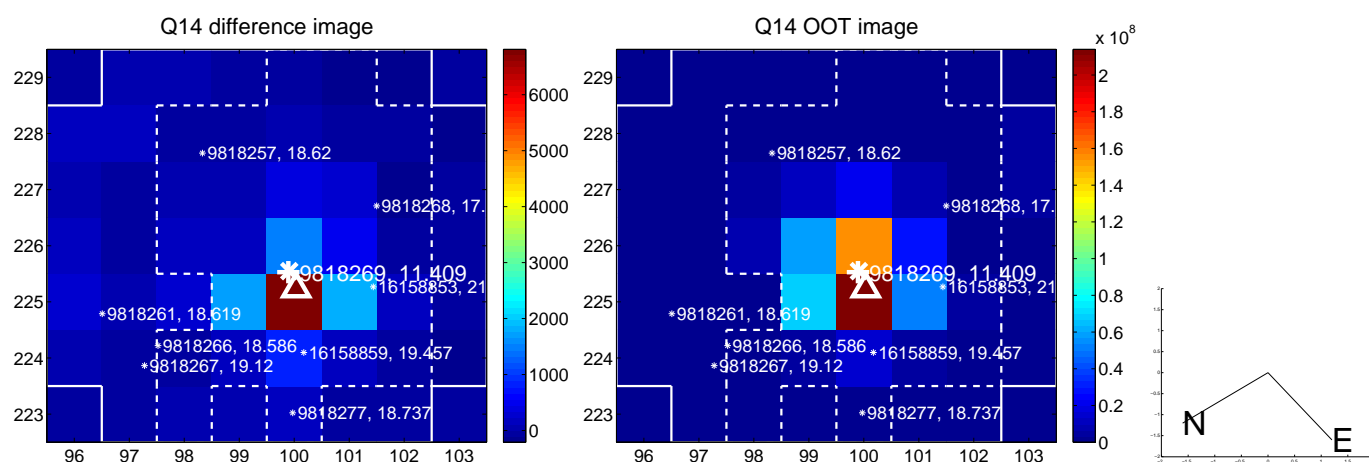
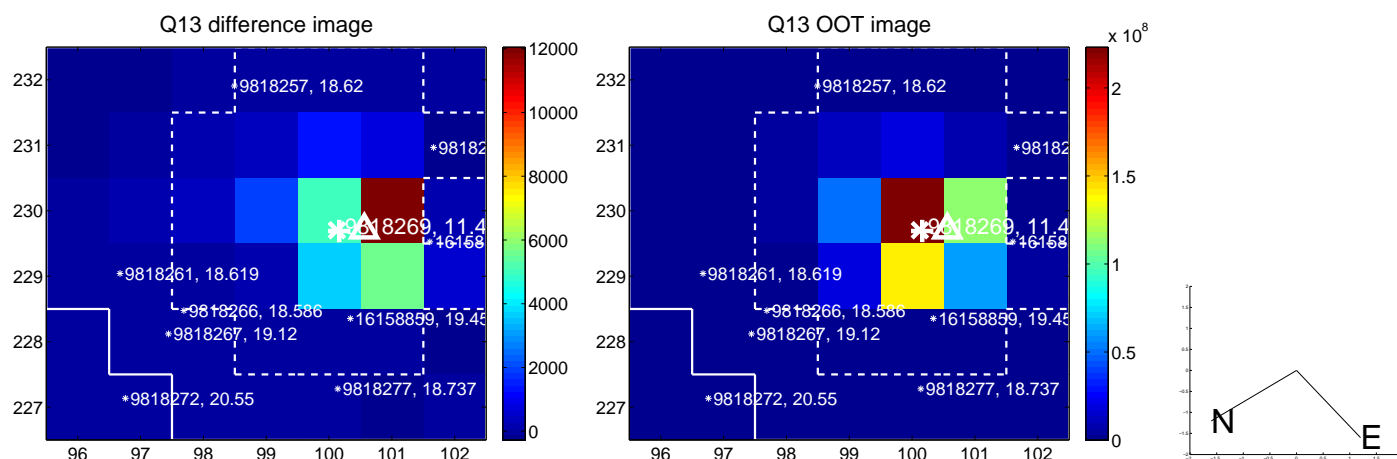




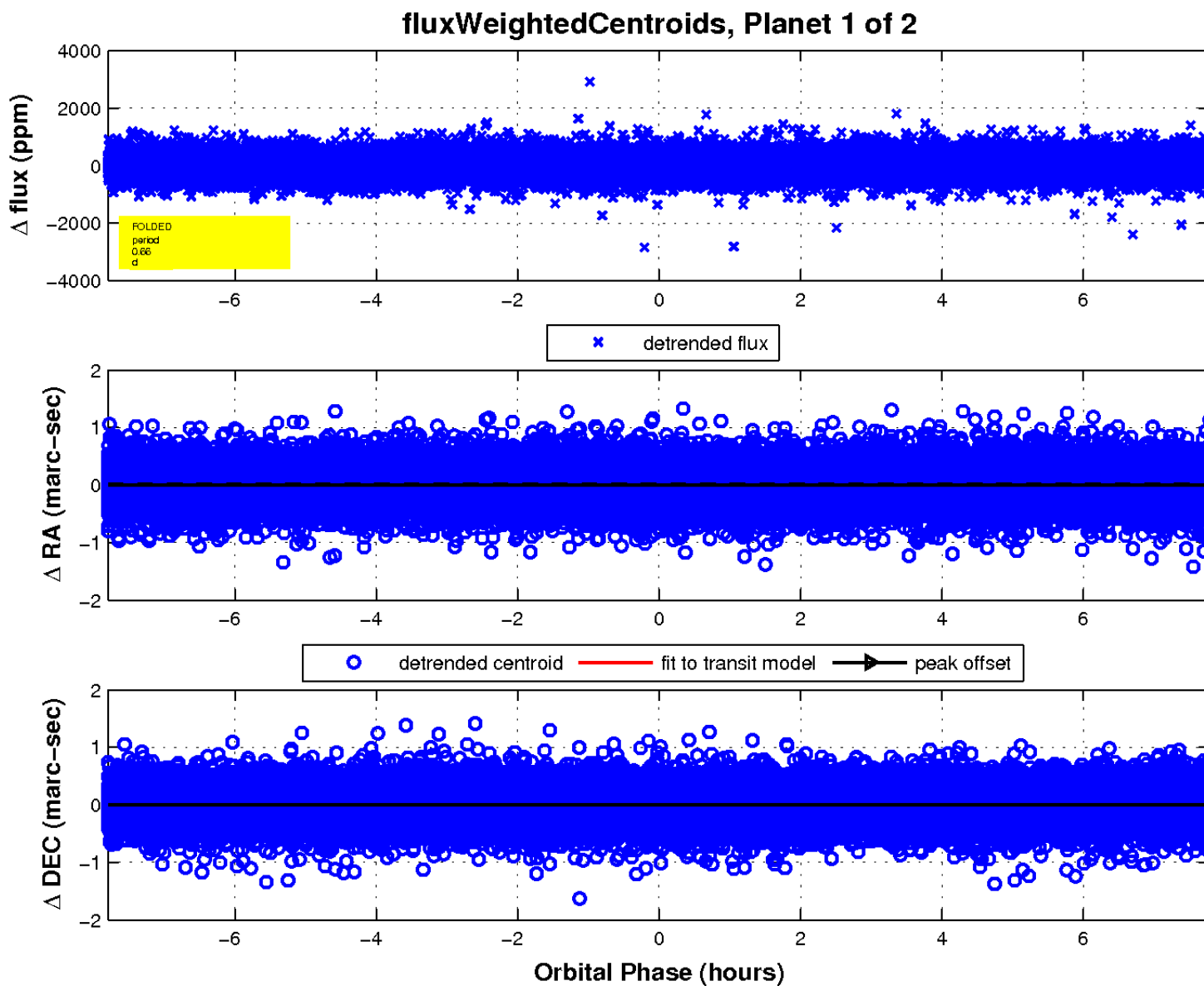
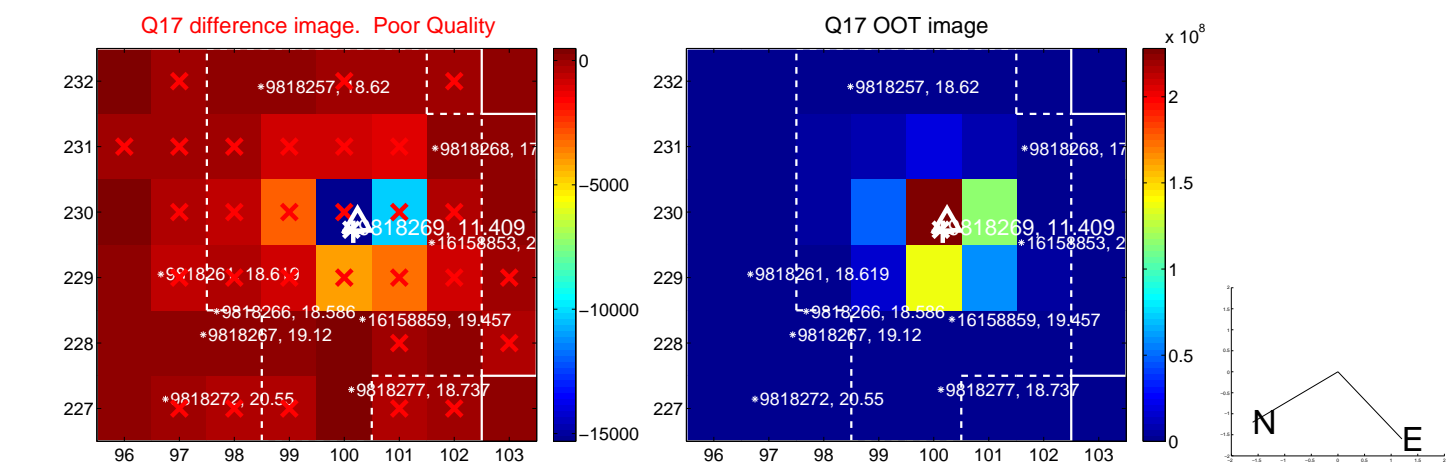
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

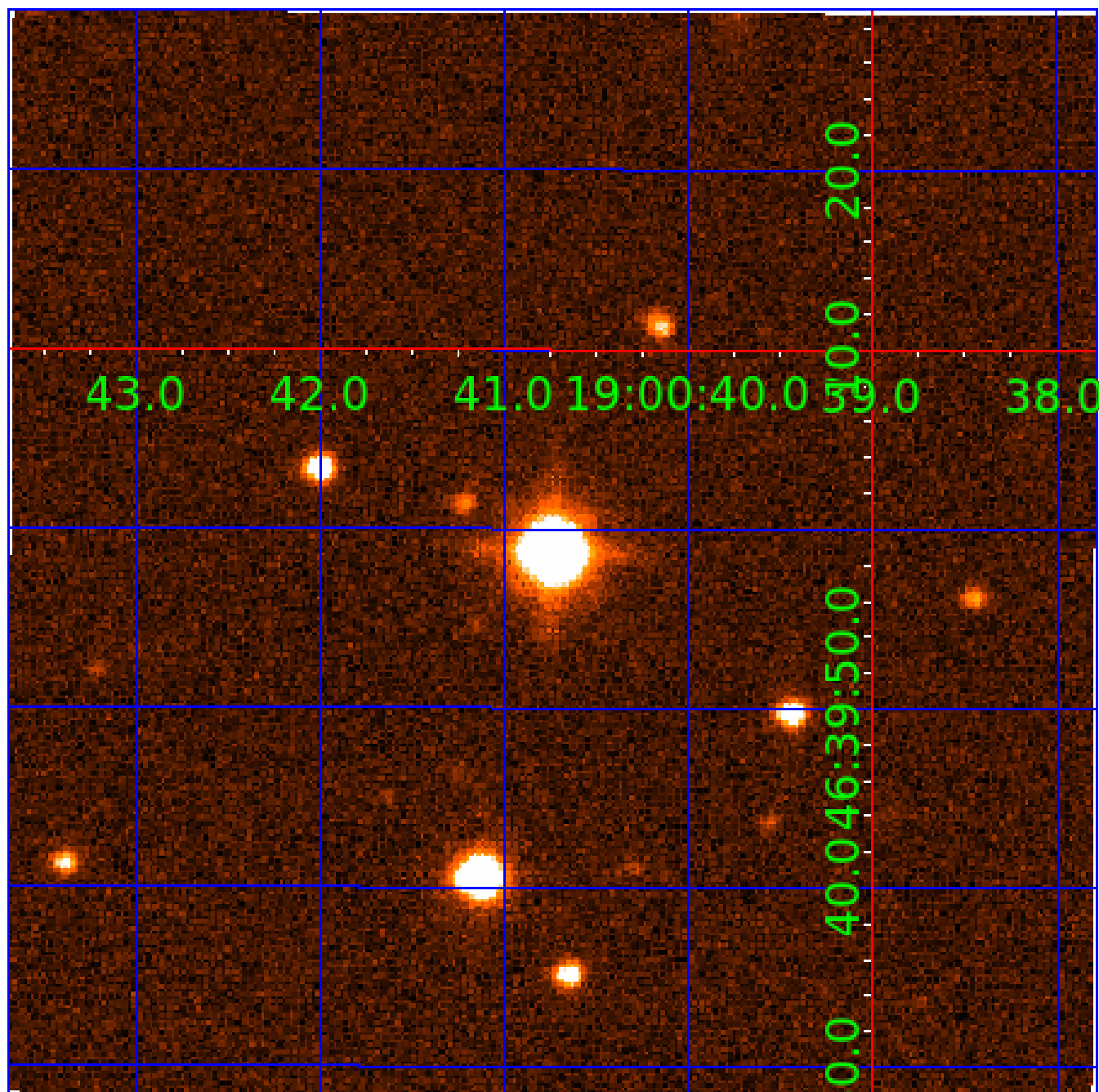


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 009818269

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009818269-01	OBS	No	0.660190	131.723037	37.5	2.599	12.9	15.1	1.84	7479	1.30	30627.80
009818269-02	OBS	No	0.660192	131.941646	31.6	2.302	9.2	12.3	1.84	7479	1.20	30627.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009818269-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED
009818269-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

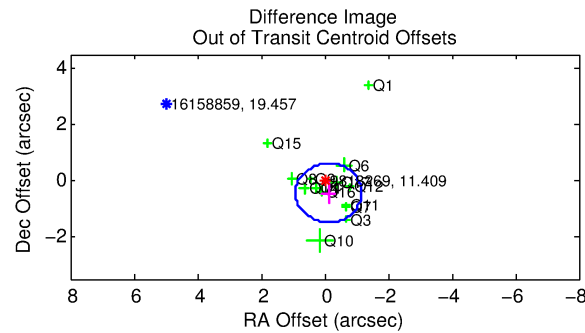
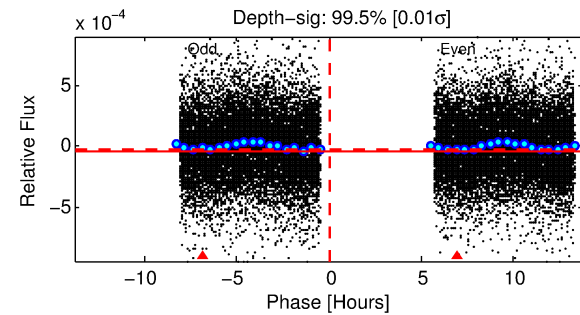
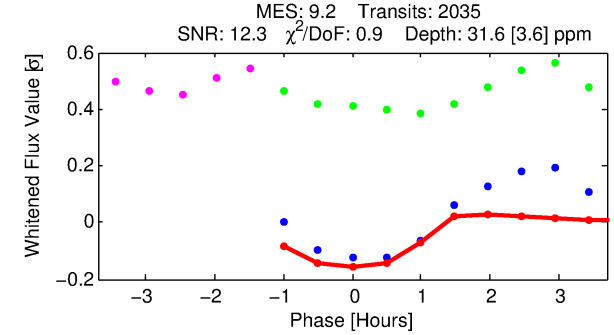
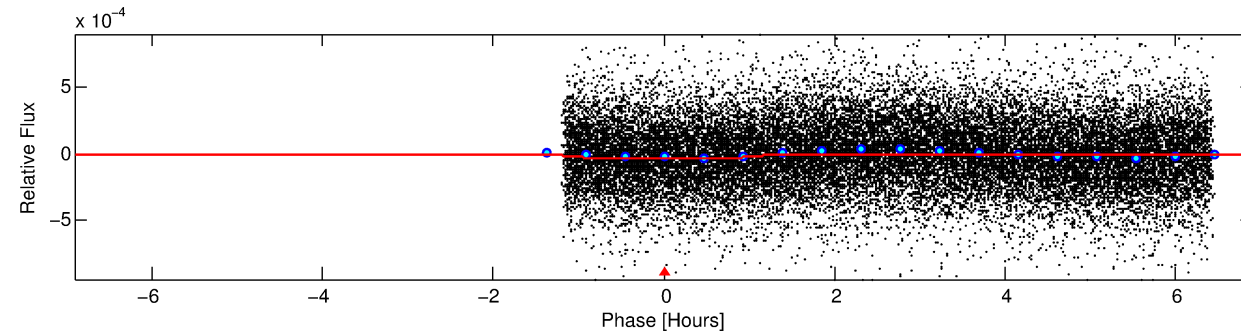
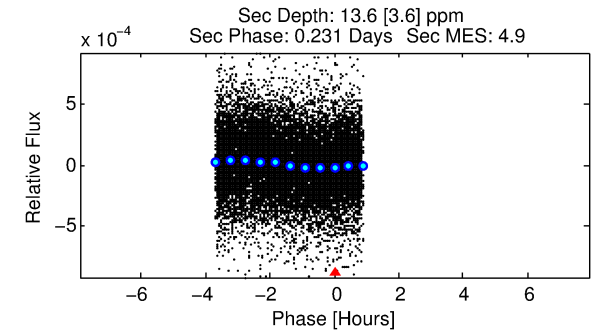
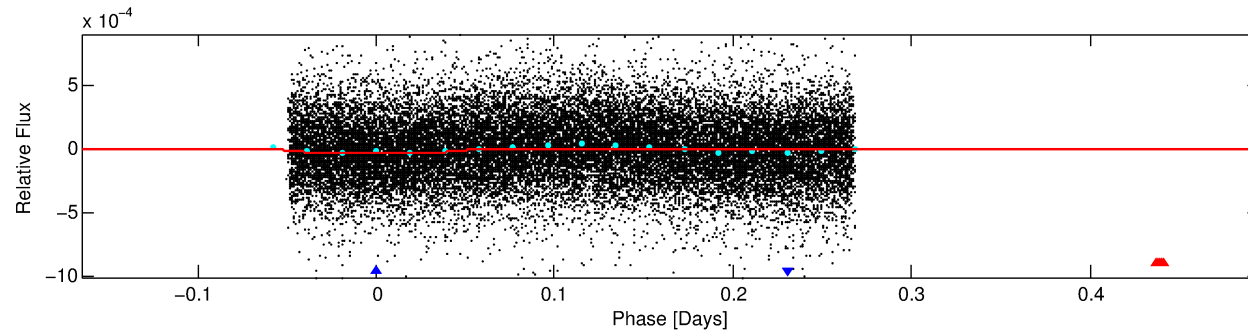
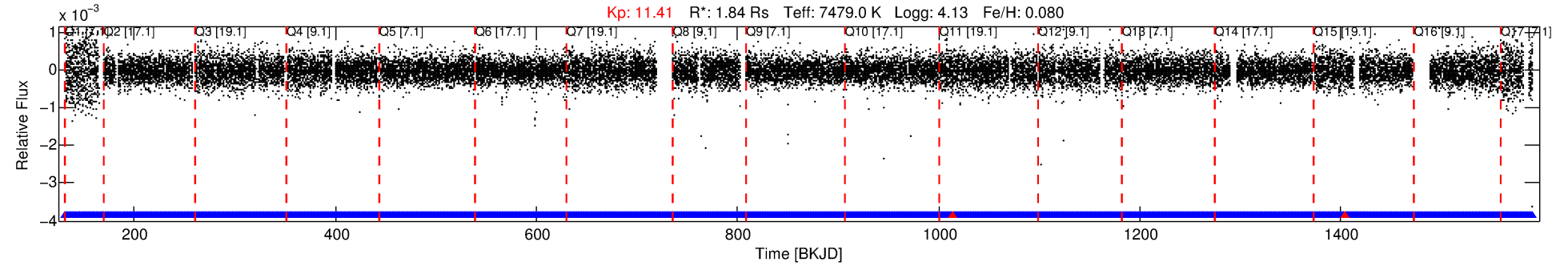
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009818269-02

No Significant Match Found

# DV One-Page Summary

KIC: 9818269 Candidate: 2 of 2 Period: 0.660 d



## DV Fit Results:

Period = 0.66019 [0.00001] d  
Epoch = 131.9416 [0.0025] BKJD  
Rp/R\* = 0.0060 [0.0022]  
a/R\* = 1.36 [1.55]  
b = 0.90 [0.53]  
Seff = 30627.69 [11997.96]  
Teq = 3373 [330] K  
Rp = 1.20 [0.59] Re  
a = 0.0176 [0.0044] AU  
Ag = 1.62 [1.41] [0.44σ]  
Teffp = 5880 [1205] K [2.01σ]

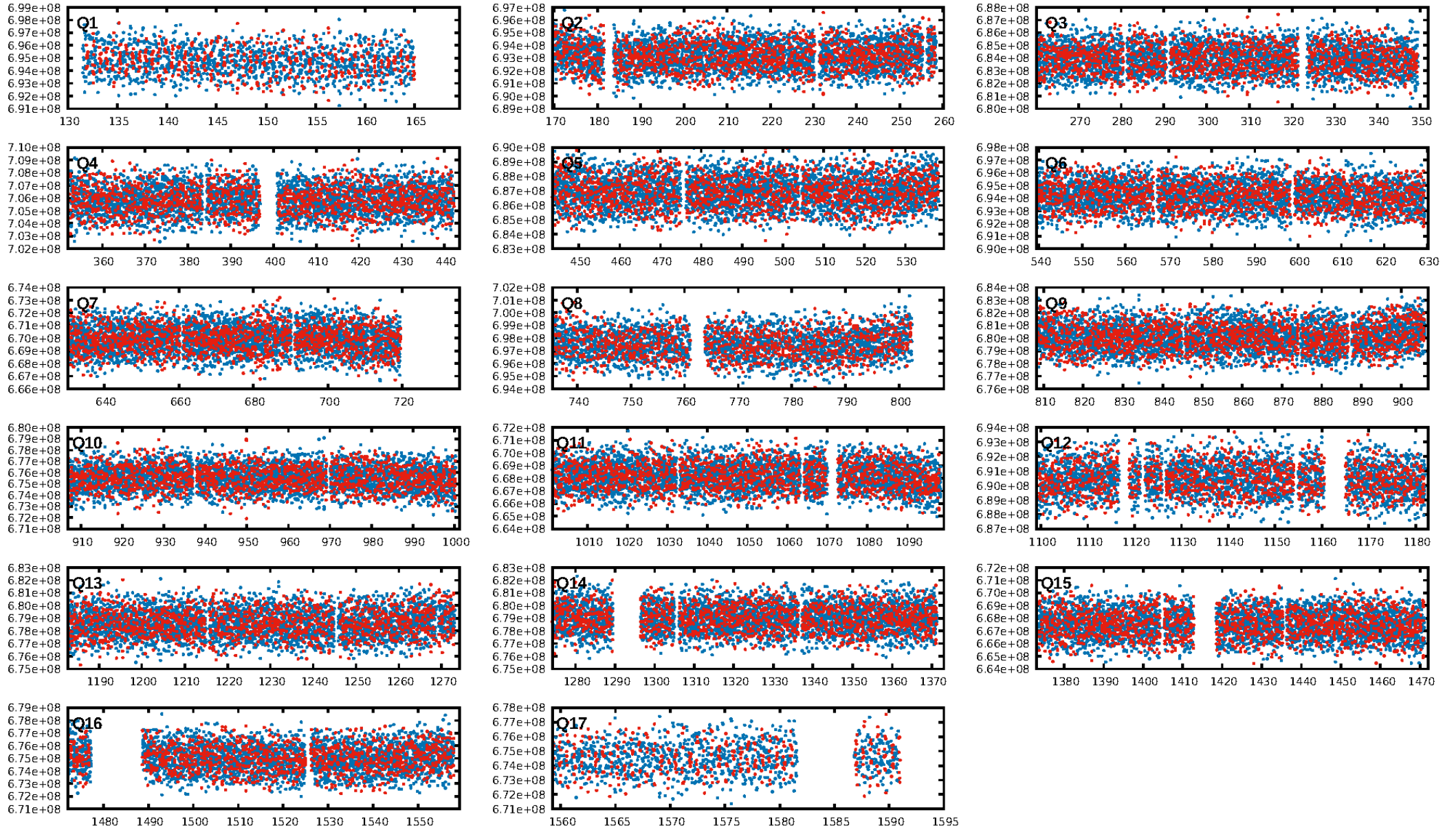
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.56e-08  
RollingBand-fgt: 1.00 [1941/1943]  
GhostDiagnostic-chr: 2.019  
Centroid-sig: 1.1%  
Centroid-so: 0.529 arcsec [2.67σ]  
OotOffset-rm: 0.450 arcsec [1.29σ]  
KicOffset-rm: 0.464 arcsec [1.30σ]  
OotOffset-st: 3/4/4/3 [14]  
KicOffset-st: 3/4/4/3 [14]  
DiffImageQuality-fgm: 0.93 [13/14]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:30:29 Z

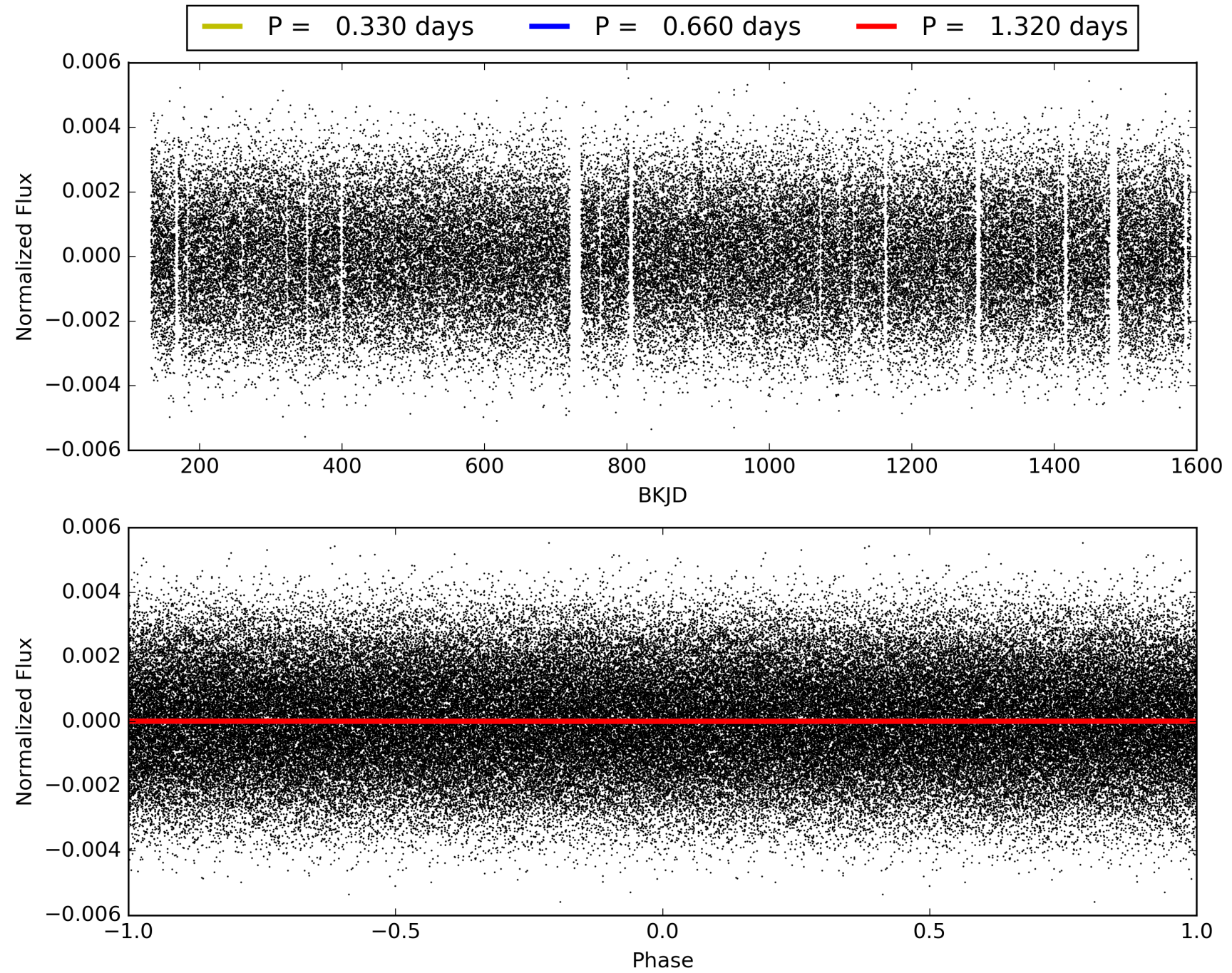
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009818269-02, PDC Light Curves





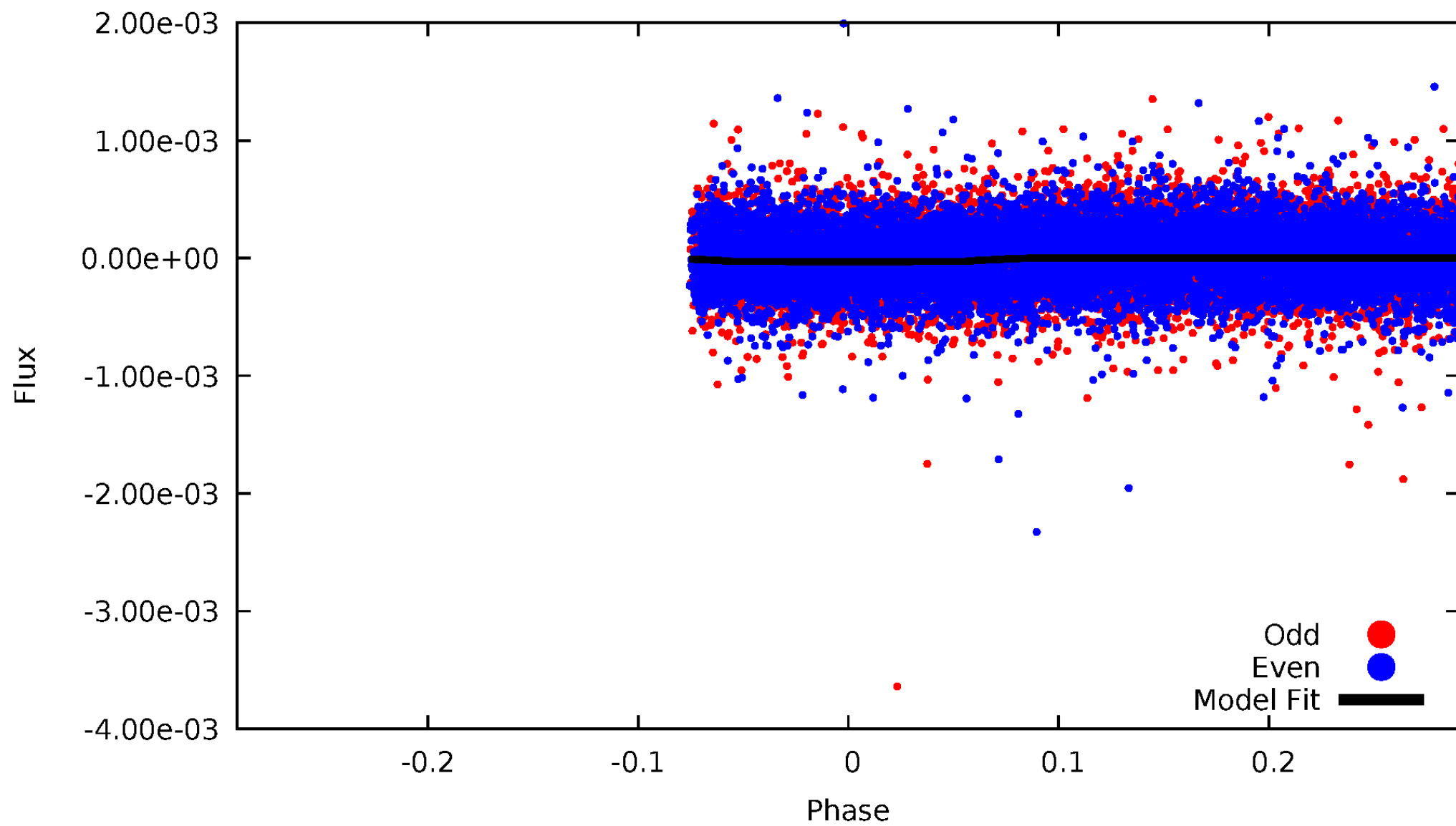
TCE 009818269-02





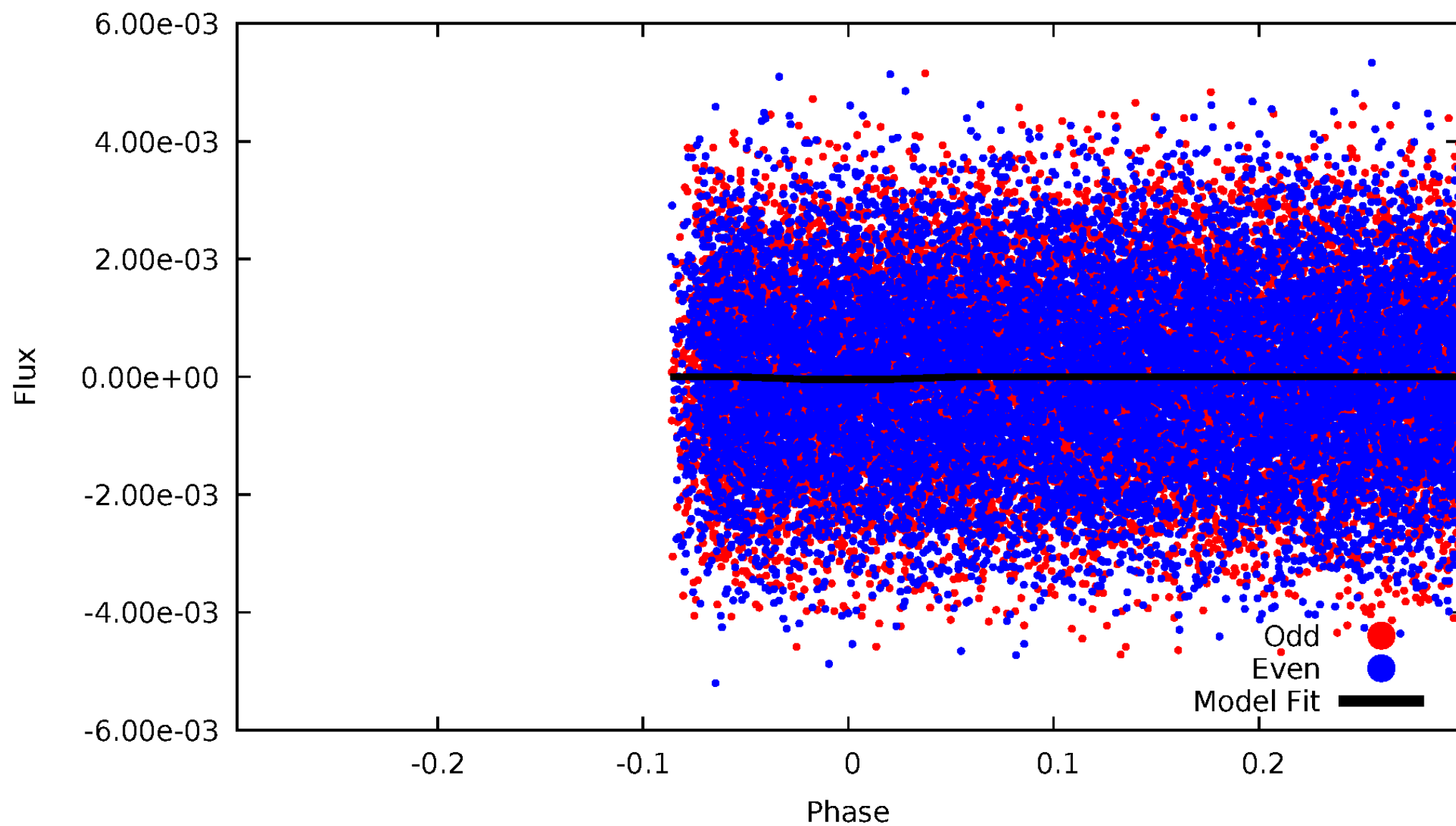
# DV Odd/Even

TCE 009818269-02



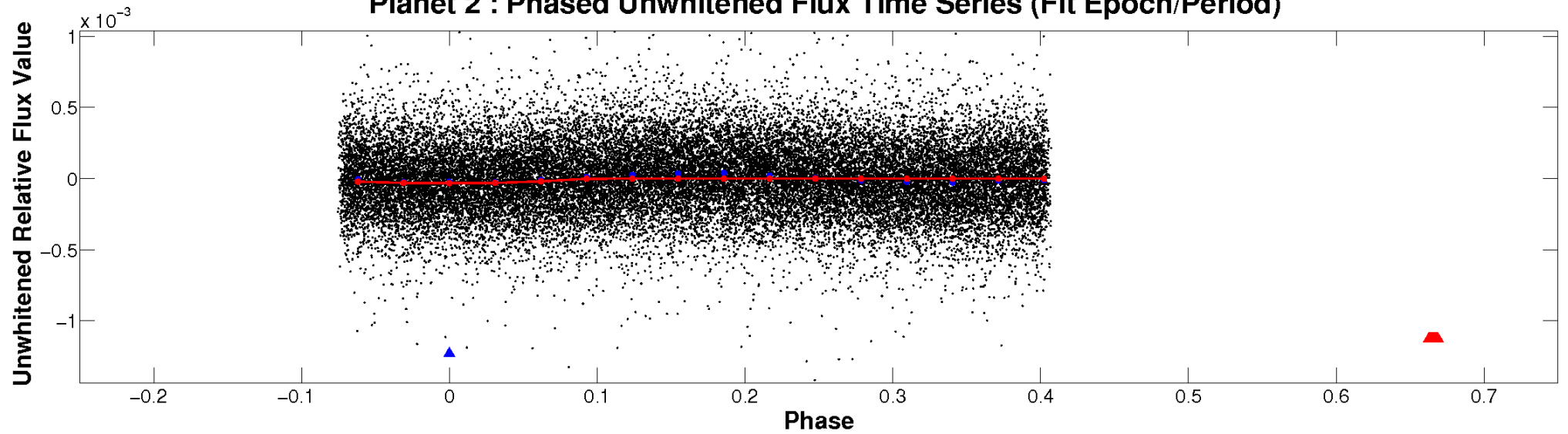
# ALT Odd/Even

TCE 009818269-02

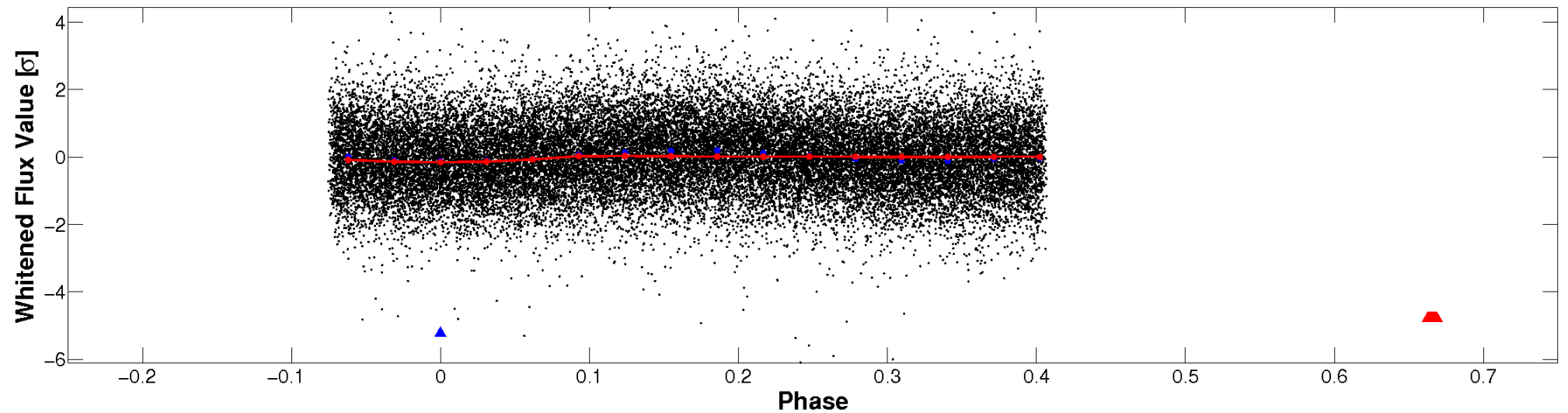


# Non-Whitened Vs. Whitened Light Curve

## Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

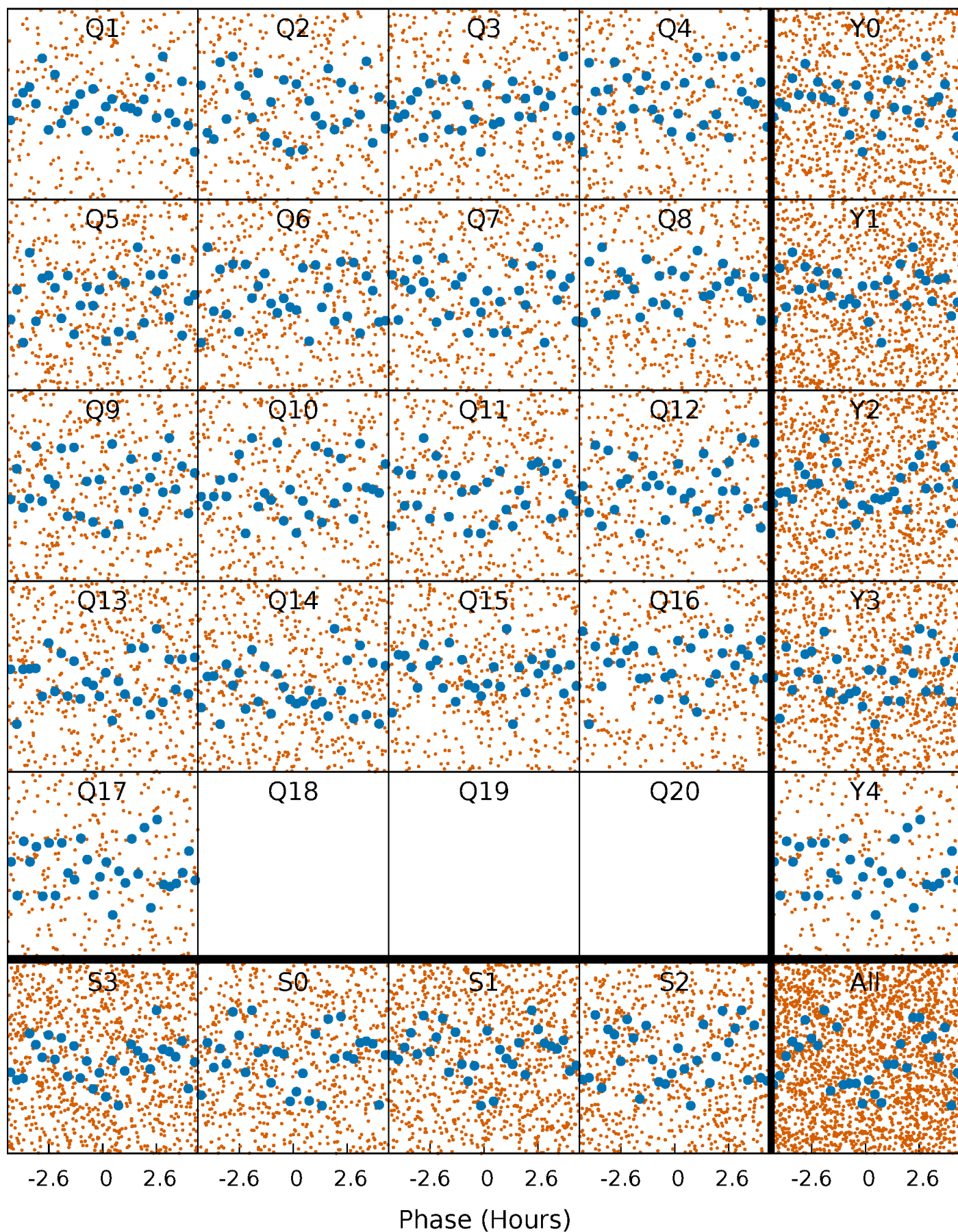


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



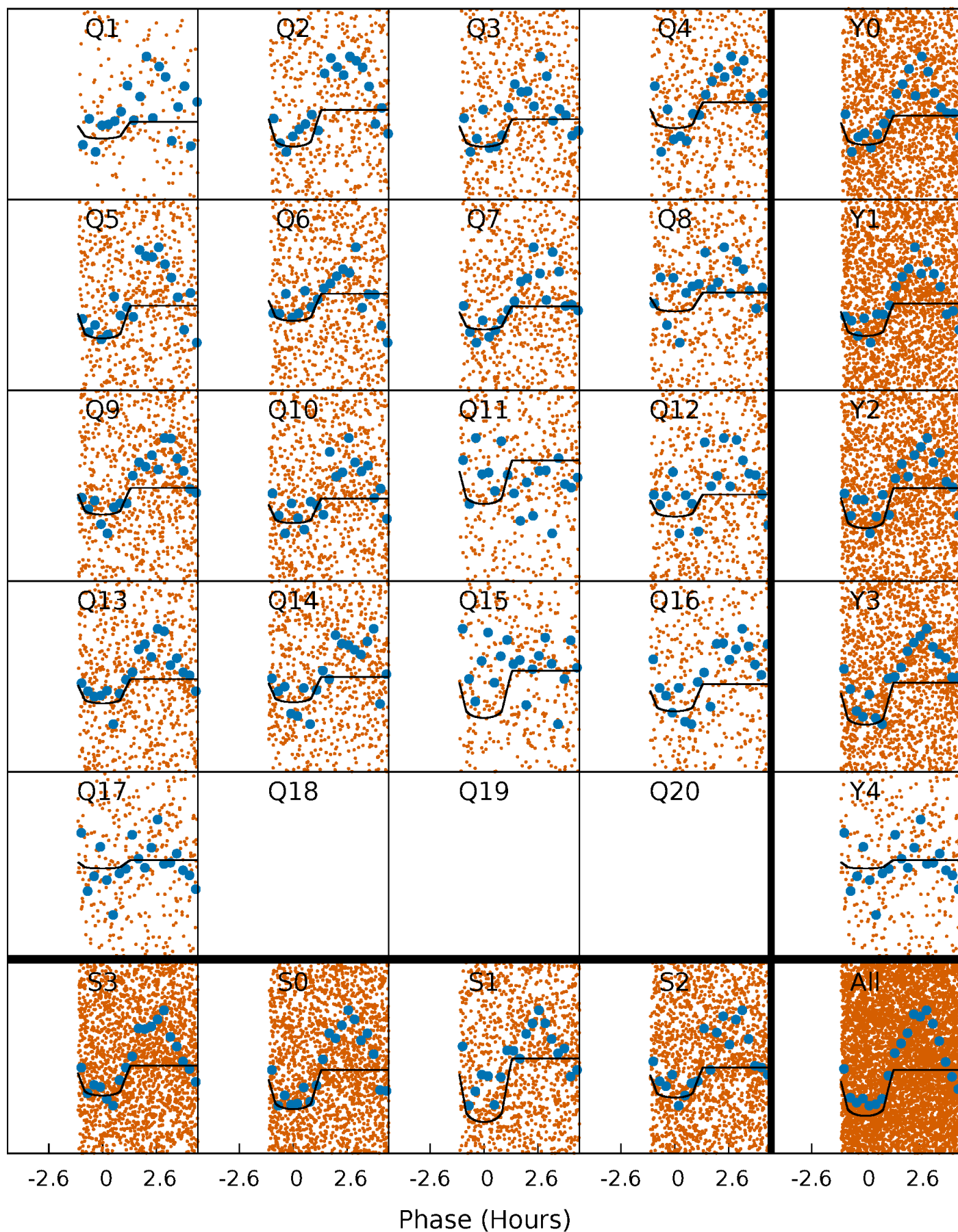
# PDC Quarter-Phased Transit Curves

TCE 009818269-02 P= 0.660192 Days  $T_0=131.941646$  (BKJD)



# DV Quarter-Phased Transit Curves

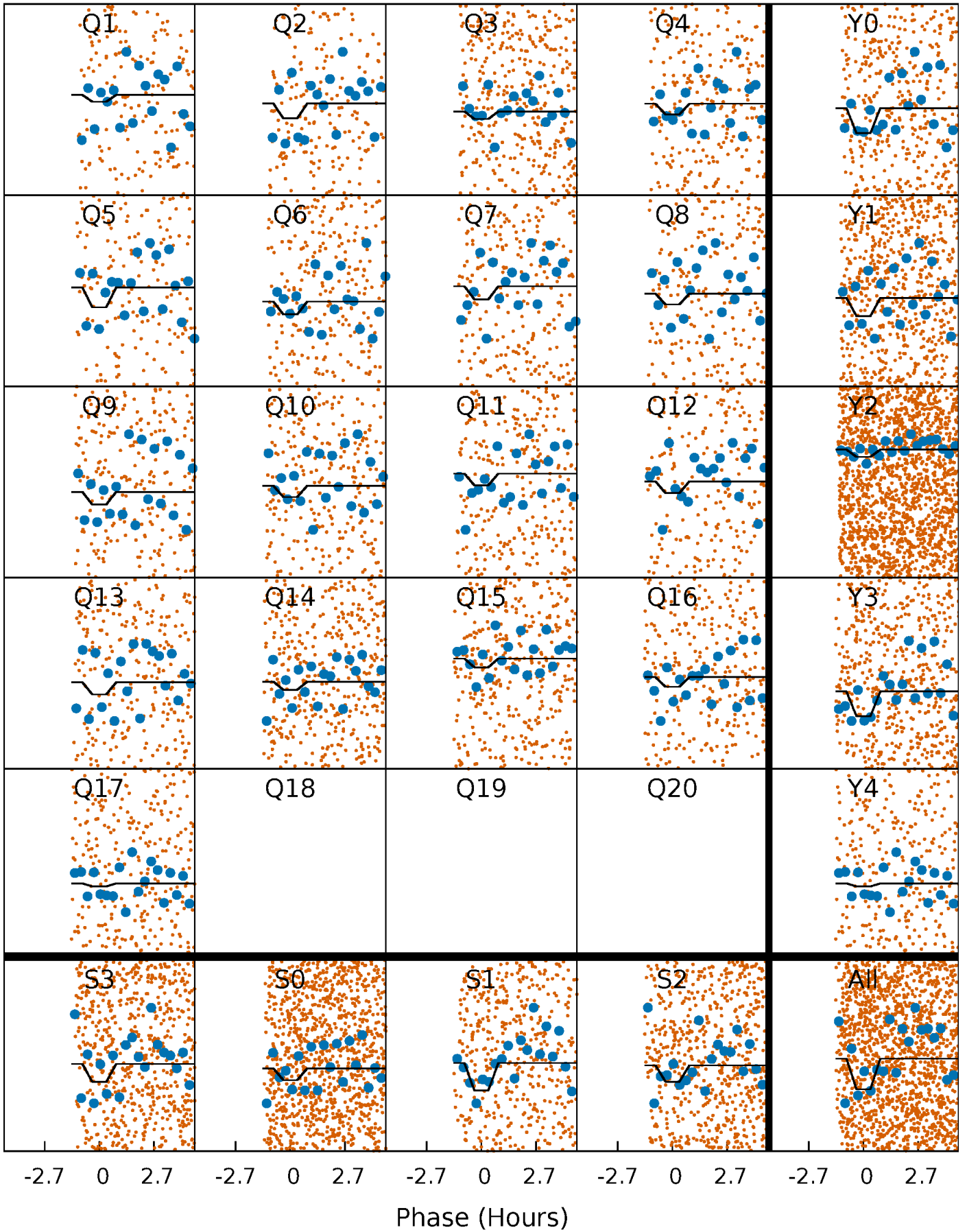
TCE 009818269-02   P= 0.660192 Days    $T_0=131.941646$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

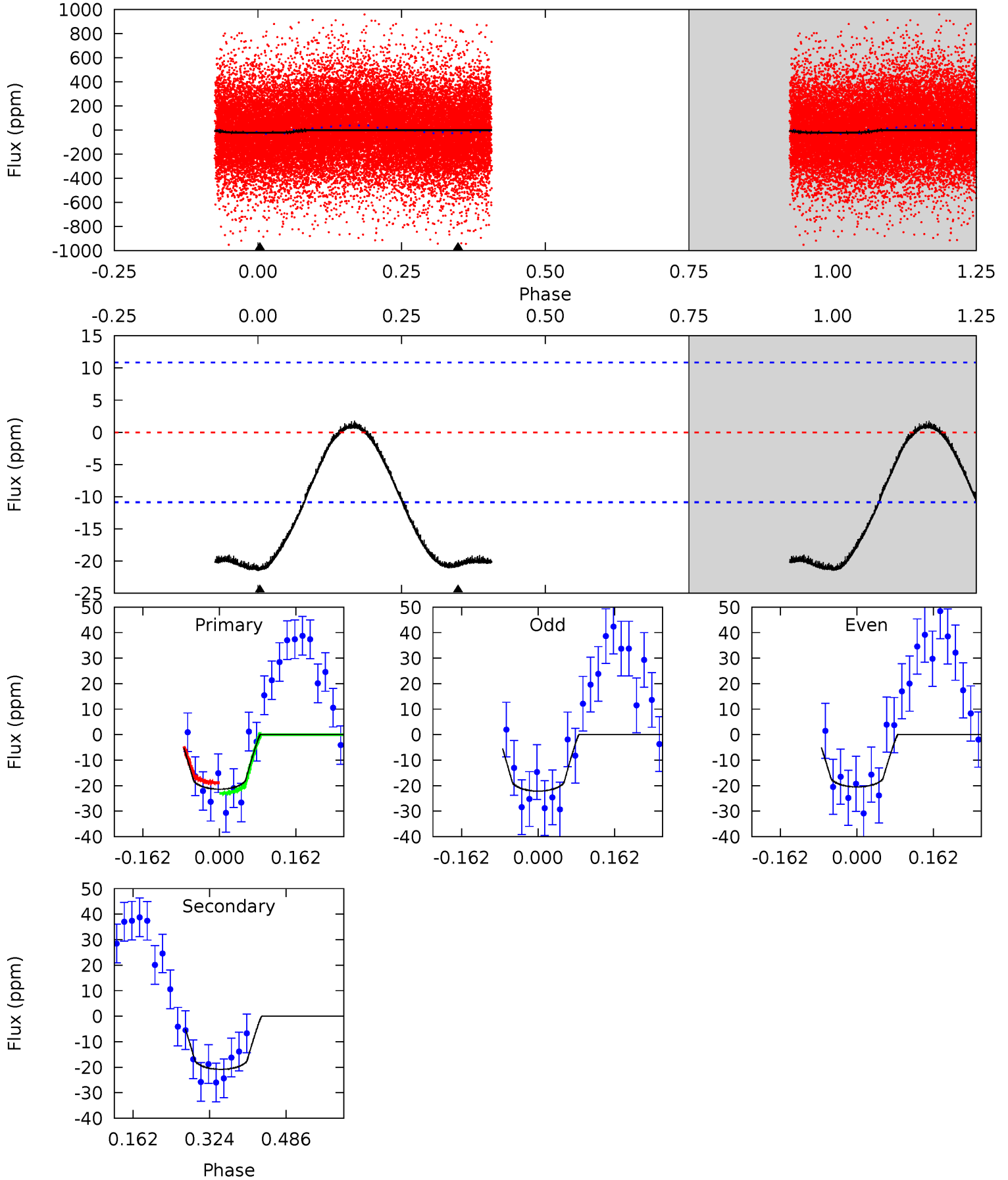
TCE 009818269-02   P= 0.660197 Days    $T_0=131.937903$  (BKJD)



# DV Model-Shift Uniqueness Test

009818269-02, P = 0.660192 Days, E = 131.281454 Days

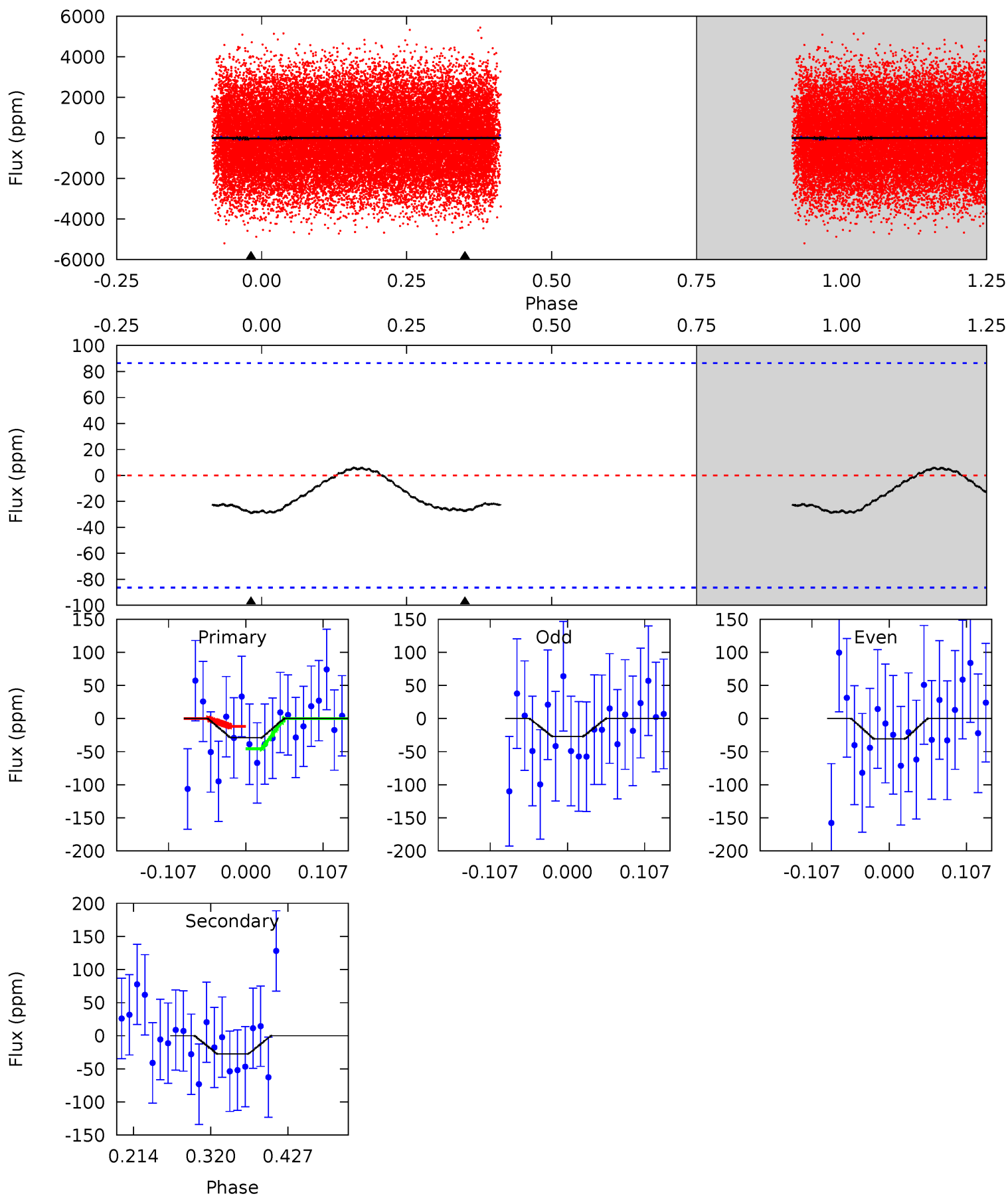
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.80	8.57	0	0	4.46	1.40	0.48	8.80	8.80	8.57	8.57	0.34	0.98	0.08	0.88



# Alt Model-Shift Uniqueness Test

009818269-02, P = 0.660197 Days, E = 131.277706 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.52	1.45	0	0	4.55	1.61	0.27	1.52	1.52	1.45	1.45	0.10	0.92	0.17	0.89



### Stellar Parameters For KIC 009818269

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7479^{+210}_{-341}$	$4.130^{+0.105}_{-0.180}$	$0.080^{+0.200}_{-0.350}$	$1.837^{+0.577}_{-0.311}$	$1.658^{+0.205}_{-0.251}$	$0.377^{+0.216}_{-0.184}$
	+3%/-5%	+3%/-4%	+250%/-438%	+31%/-17%	+12%/-15%	+57%/-49%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 009818269-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-21 \pm 2$	$1.22^{+0.51}_{-0.46}$	$4729^{+369}_{-306}$	$6177^{+1922}_{-1088}$	$2.322^{+3.745}_{-1.190}$
Alt.	$-27 \pm 19$	$1.28^{+0.51}_{-0.44}$	$4744^{+324}_{-318}$	$6344^{+2342}_{-1988}$	$2.457^{+4.735}_{-1.744}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

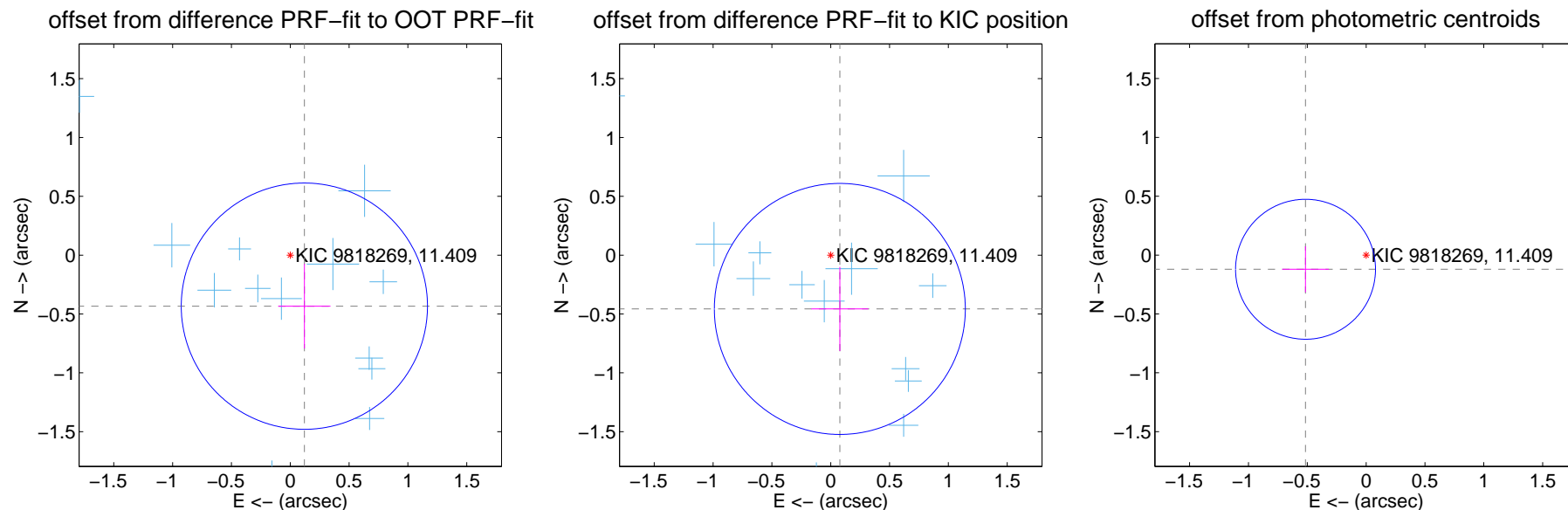
## DV Centroid Data

Supplemental centroid analysis for 009818269-02. **Kepler magnitude: 11.41.** Transit SNR 12.26

There are 13 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

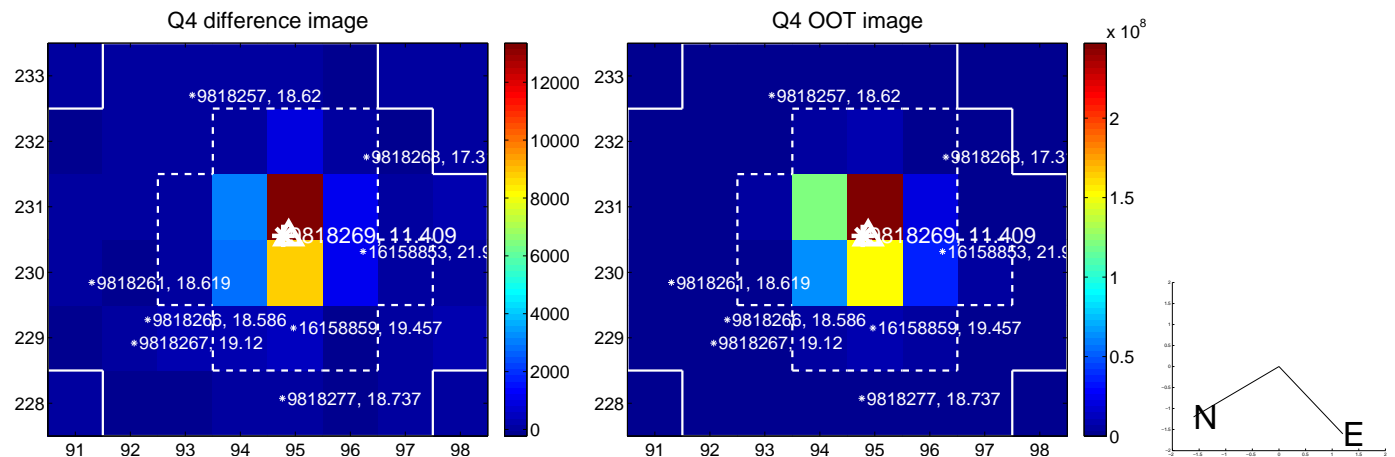
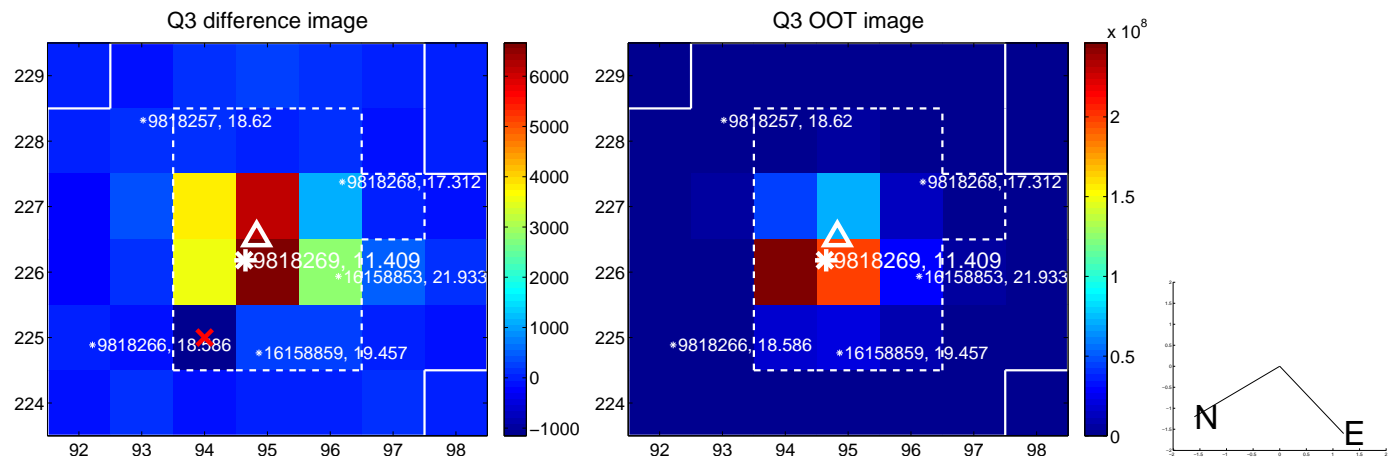
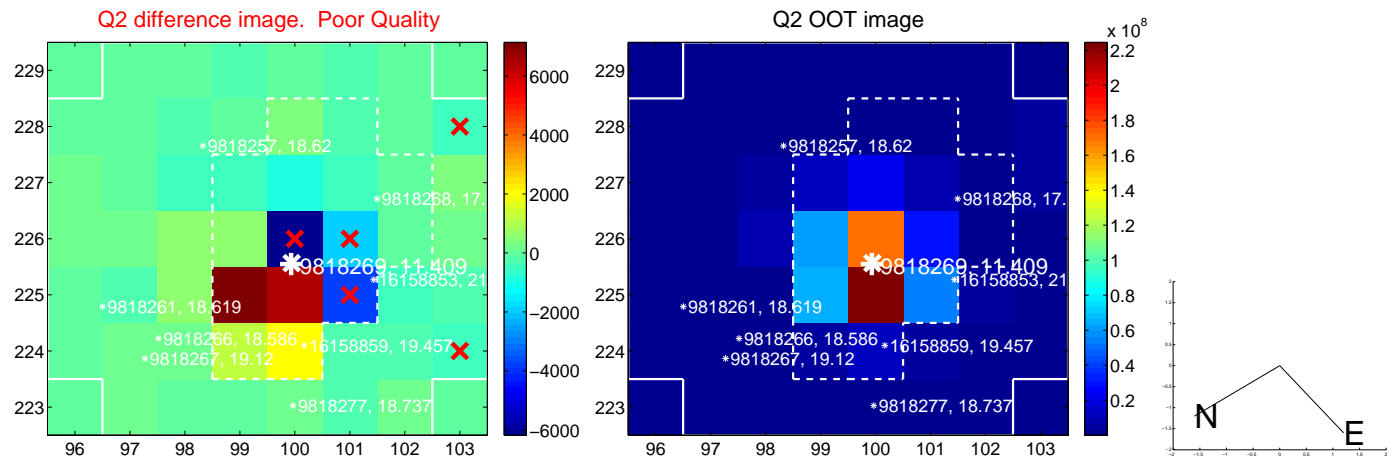
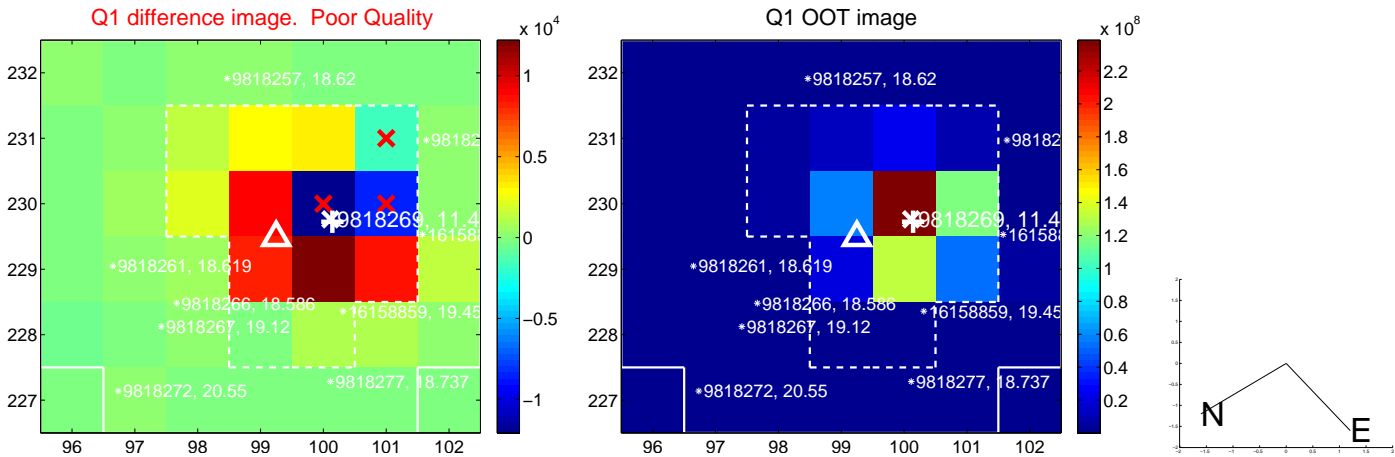
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.450 \pm 0.349$	1.29	$-0.120 \pm 0.222$	$-0.434 \pm 0.360$
PRF-fit source offset from KIC position	$0.464 \pm 0.356$	1.30	$-0.077 \pm 0.243$	$-0.457 \pm 0.357$
photometric centroid source offset	$0.53 \pm 0.20$	2.67	$0.51 \pm 0.20$	$-0.12 \pm 0.20$



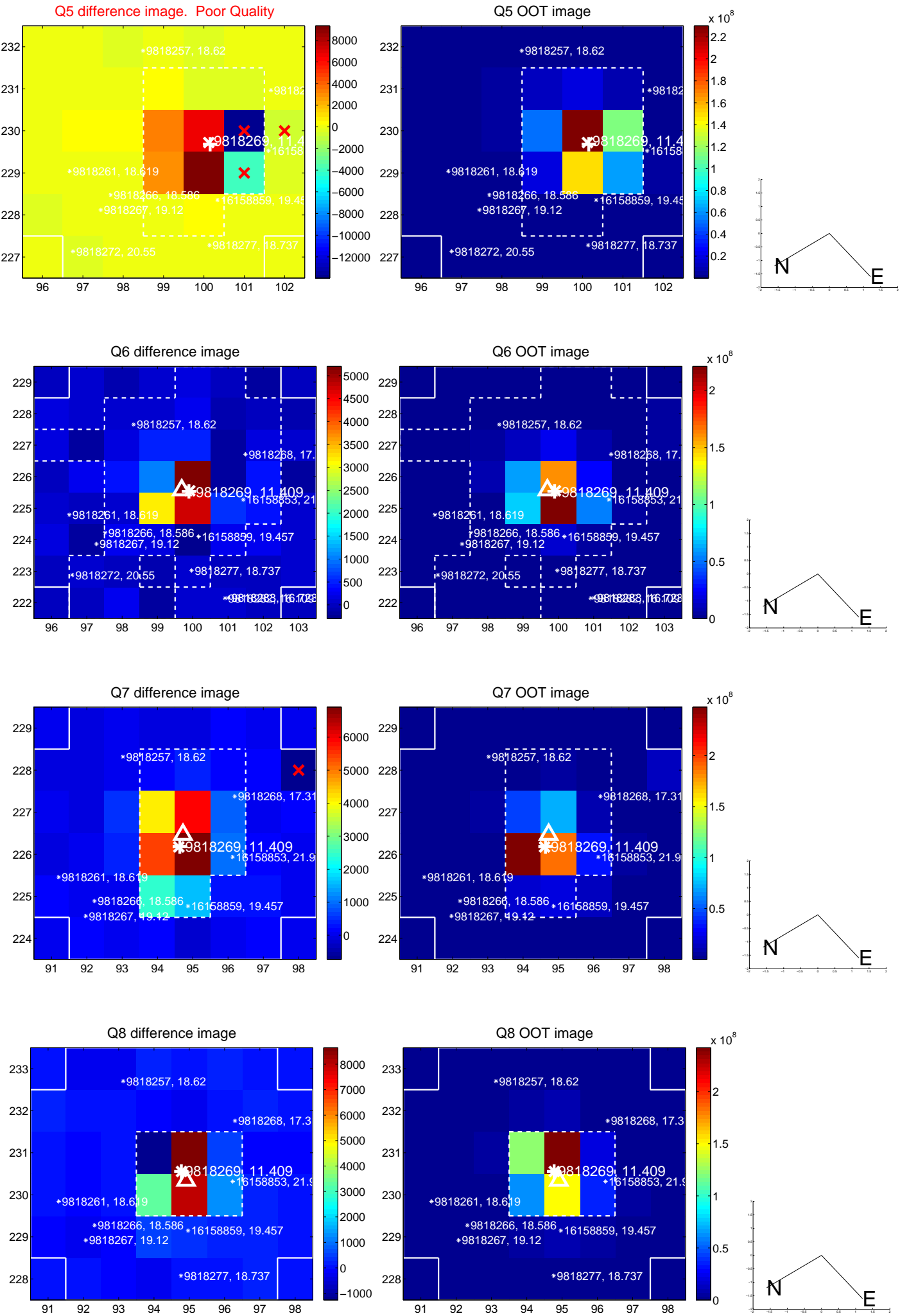
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.



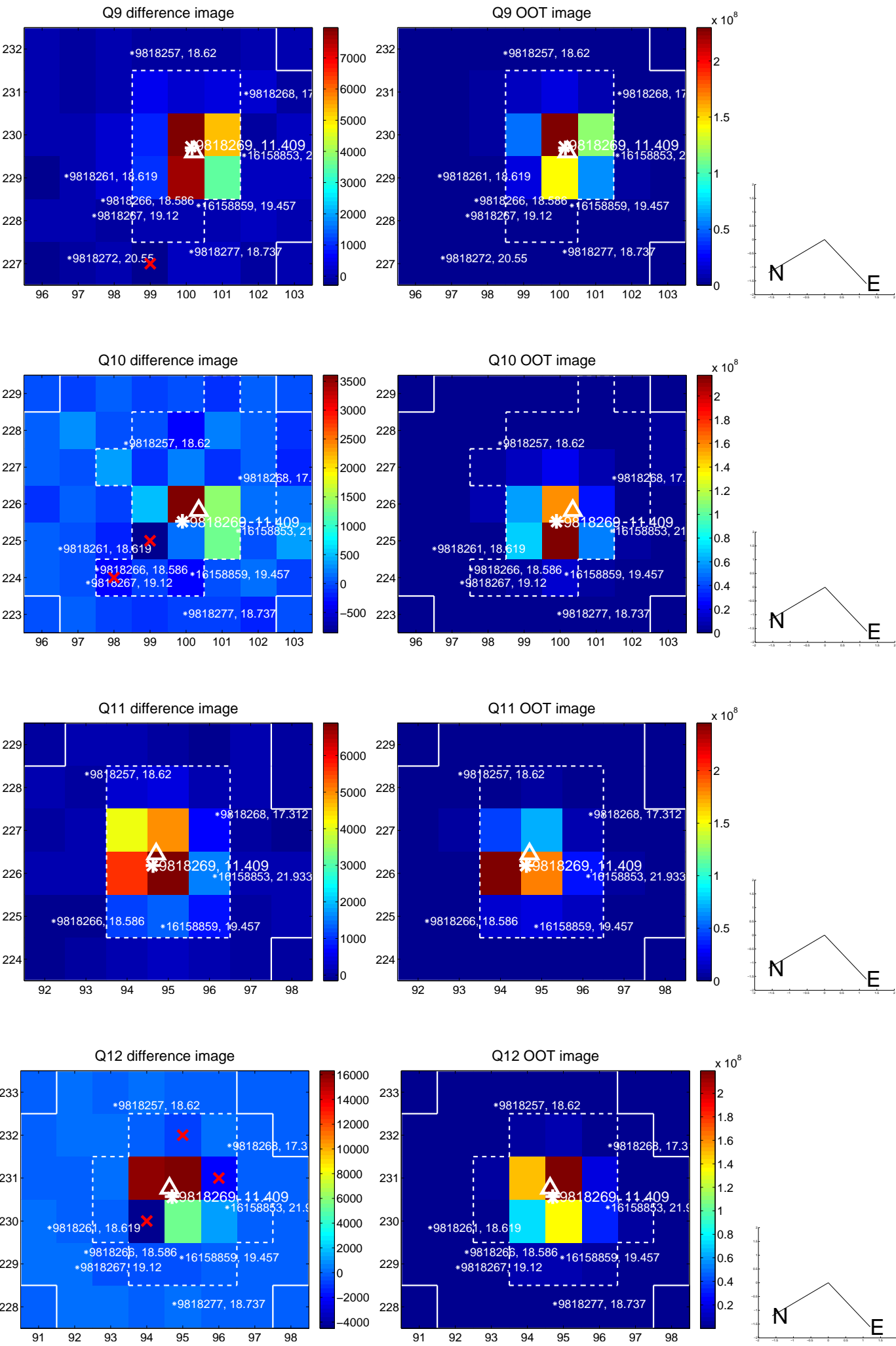
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



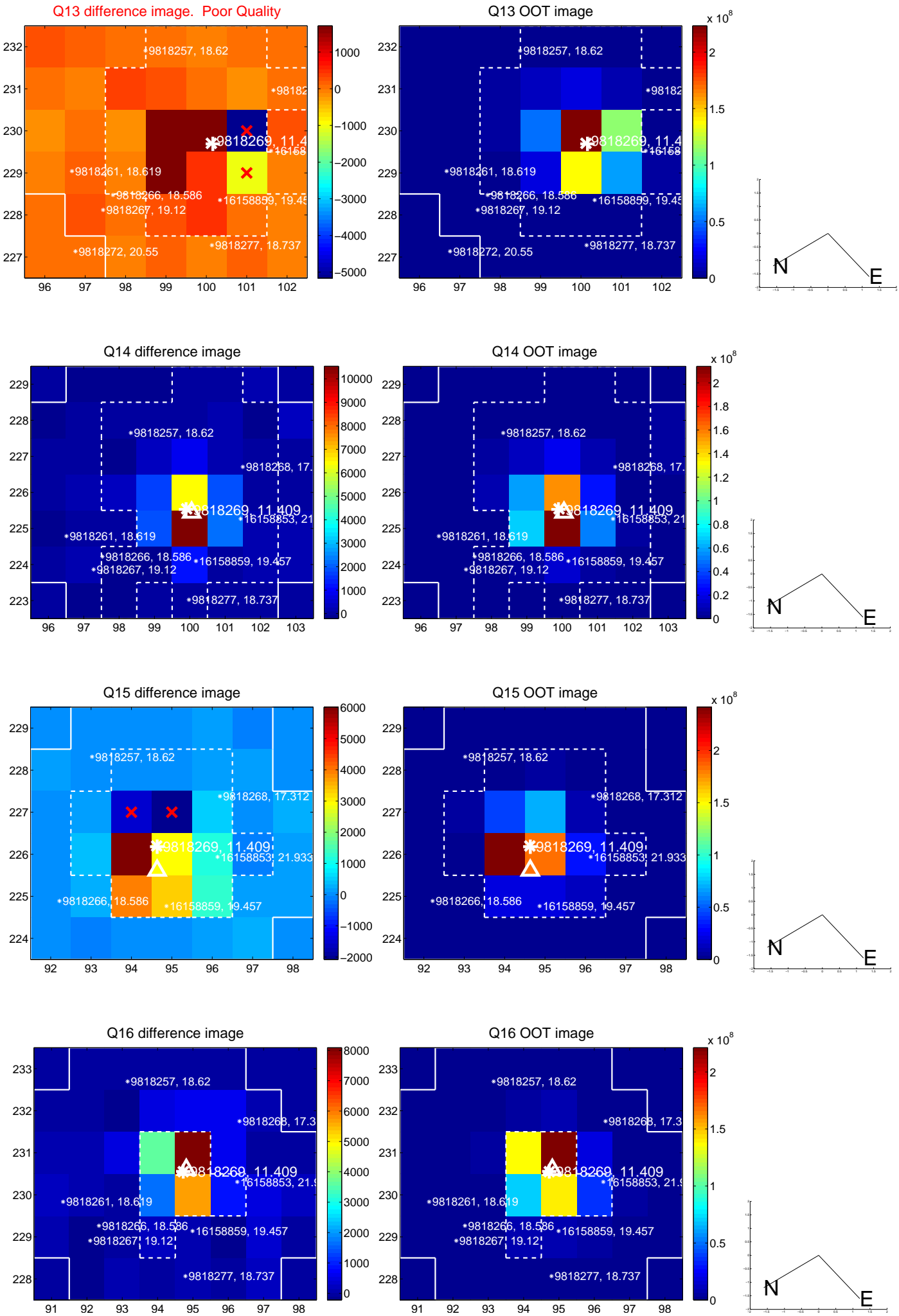
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



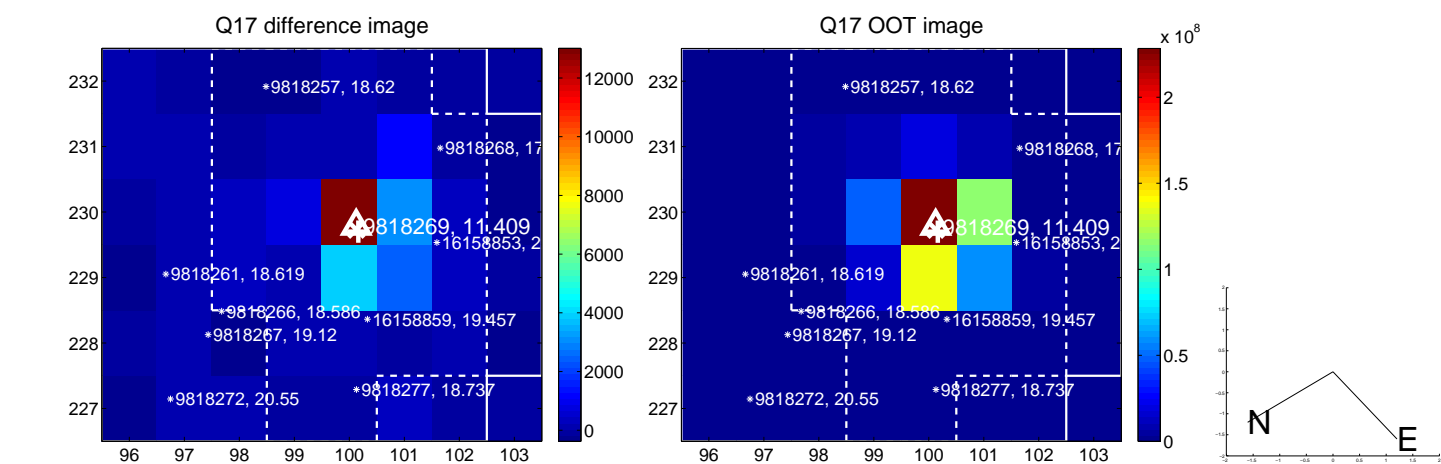
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



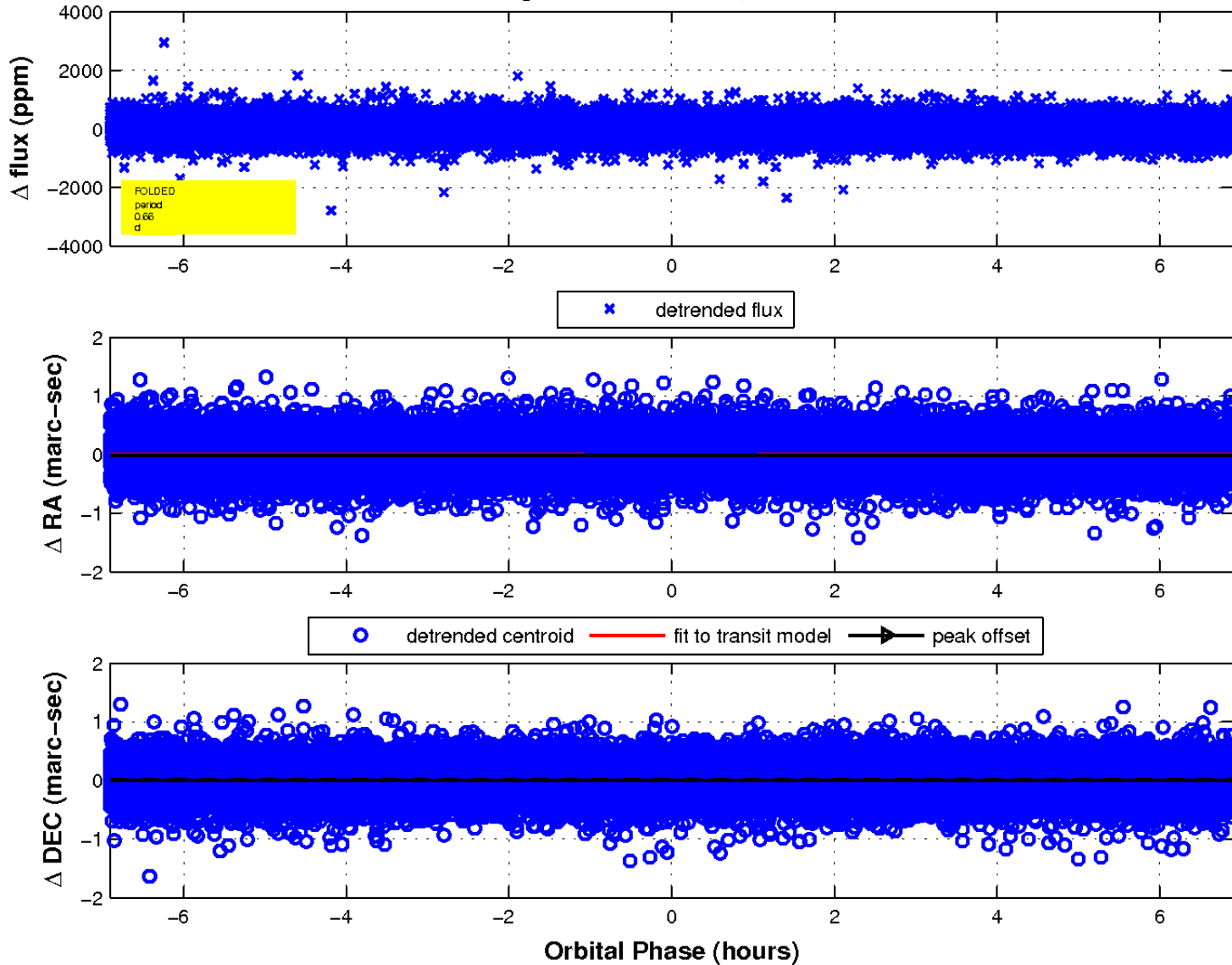
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 2





UKIRT Image

Declination

